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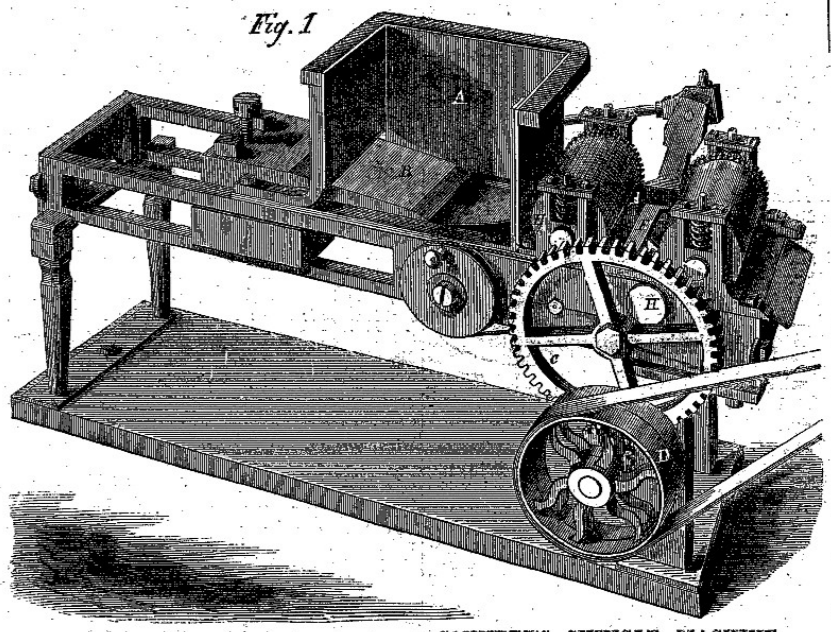
Improved Shingle Machine.

This machine is intended to make smooth and perfect shingles of a different form from those generally used. It is well known that common rough shingles do not last so long as those having smooth surfaces, and this is readily accounted for by the facility with which the latter shed moisture.

The shingle made by this machine is of uniform thickness at the exposed end or tail, but tapered, of course, at the other end, so as to permit one to overlap the other. The general arrangement is well shown in the engraving. The bolt is placed in the hopper, A, so to speak, and the knife, B, forced through it by the action of gearing, C, driven by a pulley, D. This severs a straight slab from the bolt, which is carried on through the machine by the feed roller, E, to the center of the machine, where it meets a knife, F. This knife has a vertical motion given it by a cam, G, below the frame, so that it shaves a thin end on the shingle, and is then elevated quickly, allowing the piece to pass on. Previously, or during the passage of the material, the edges have been planed by knives affixed to the side of the frame. One of these is fixed and the other is operated by a screw through pulleys, H, so as to adjust it for any width.

Fig. 1



CONNETT'S SHINGLE MACHINE.

These are the principal details. The machine is strong and substantial, and is calculated to produce a very superior class of work.

A patent is now pending through the Scientific American Patent Agency by A. M. Connett, of Madison, Ind., whom address for further information.

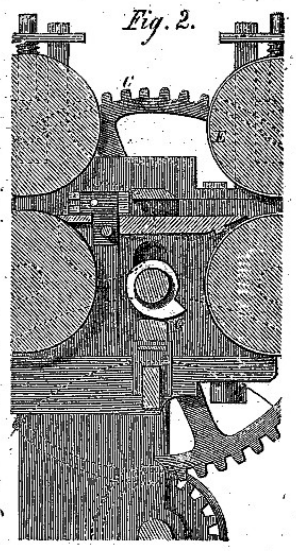
Tunnel Under Chicago River.

The Common Council of Chicago has ordered the tunneling of the south branch of the river in that city at the Washington-street crossing. The tunnel is calculated to relieve three bridges and enable 10,000 vehicles and 50,000 persons, who now cross those bridges, to pass and repass the river without obstruction or loss of time. The enormous amount of travel over the bridges and the necessity of continually opening and closing them to accommodate commerce, speedily wear them out, so that some of them are always out of repair.

How Burglars Operate on Safes.

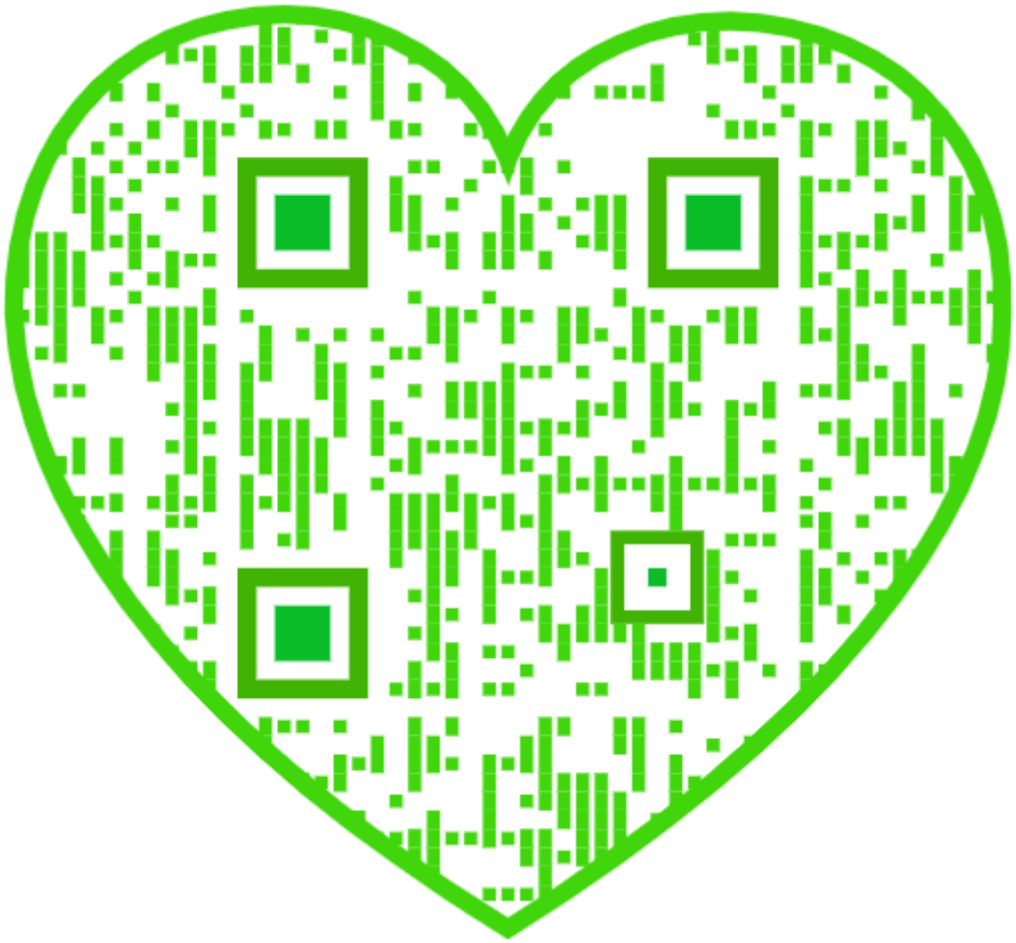
A month or two ago we remarked that the exploits of the London burglars upon the premises of Mr. Walker, the jeweler, and the subsequent trial between Mr. Walker and Messrs. Milner, have led to great efforts being put forth by the safe makers to increase the security of their wares. Since that time as many as forty patents have been got out by safe-makers, all with the view to increase the ability of the safes to resist the attacks of burglars. We have just seen a safe that has been constructed upon one of these patents. It was produced by a Wolverhampton firm—that of Mr. George Price, of the Cleveland Works—and by the time this appears in print, it will be on the premises of the purchaser, in London. It has been bought by Mr. Johnson, jeweler, of Threadneedle street, who was robbed of property worth about £4,000, in 1864, by a party of burglars known as "Scotty's" gang. The ability with which the burglars opened the safe in the stamp office at Manchester, and stole property worth £7,000 lately, has shown that the thieves have improved in their method of attack since the robbery at Mr. Walker's. In the opening of Mr. Walker's safe, no drill was used, but the outside band was forced partly away from the left-hand side of the safe, sufficiently to allow the point of the crow-bar to enter and bite under the door-plate. With the stamp-office safe, however, the burglars first drilled a piece out of the point of the outside band, at the extreme left-hand corner, over the door. They then cut the piece so drilled square, which exposed the back of the door-plate, behind which they drove their first wedge, or chisel. Next they forced another wedge a few inches from the first, but against the face of the outside band, which brought away the door-plate sufficiently to allow the crow-bar to be got at the back of the door, as with Walker's safe, and with one wrench the door was opened. We examined the safe after the robbery, and, with the exception of the piece—about one inch by half-an-inch—cut out of the outside band—scarcely a mark was observable on the exterior. In respect of the new safe which has just been sent from Wolverhampton, the object of the maker seems to have been to construct one without any additional mechanism to the ordinary safe, so that it shall be impossible for a burglar to insert a wedge around any portion of the door at all. By making a safe wedge-proof, it is also crow-bar proof, as the latter instrument is of no value without a bite and a fulcrum. Mr. Price's doors being case-hardened, he had only to carry the principle a little further and case-harden the frame into which the door fits. This is what he now does, and, in addition, forms the inner frame of bars 5 inches wide by 1 inch thick, which, instead of being dove-tailed at the corners, as is usual in all safes, he bends the bars. In order to make the four pieces into one continuous ring or band, he dove-tails the straight pieces into the bent pieces, and so obtains the greatest strength such a ring or band of iron is capable of giving. This case-hardened continuous ring or band is put inside the body plates—not outside, as in the safe opened at Walker's and the Stamp Office. As a further protection, if thought to be necessary, the inventor welds another bar of iron 5 inches by $\frac{3}{8}$ inch, and shrinks on to the outside at the back and front of the safe. The construction of this safe is decidedly simple, and it seems to us to offer a very great amount of resistance to the operation of the burglar's implements which have recently proved so destructive of security.—*Ironmonger.*

Fig. 2.



THE TELEGRAPH.

After four trials, involving an expense of not less than $3,000,000, the great work of successfully laying a submarine telegraph between Europe and America is accomplished, and on the 29th ult. the New York dailies were, by its means, furnished with news from central Europe only thirty hours old. The cable of 1858 indisputably worked, but in an unsatisfactory manner and only for a very short time. There is hope that this present line will prove to be a permanent success. If perseverance and determination ever deserved success it is in this instance. Its success will be a cause of rejoicing among all enlightened and intelligent people.



OUR SPECIAL CORRESPONDENCE.

Finding the summit—Comparative profits of grain and grass growing—Reaping machines not profitable—Great value of mowing machines to women.

ORE HILL, SALISBURY, CONN.
July 18, 1866.

Desiring to spend a few of the hot weeks among the mountains, and not knowing where to go, I opened my school atlas to examine the geography of the Berkshire hills. Being possessed of the rare knowledge that water runs down hill, I traced up the water courses to their sources, and found that, from a spot near where the corners of Connecticut and Massachusetts meet the eastern line of New York, the small streams radiate in all directions. I concluded that that must be the highest land in the region. Judging this to be about a hundred miles from New York, I called at the Harlem Railroad office for a ticket that distance up the road by express train, and was furnished one to Millerton, ninety-six miles. After enduring for four hours the intolerable dust of an American railroad, I arrived at Millerton, and was told by Mr. Sherman, of the Millerton Hotel, that the summit was four miles above, and that it is 1,135 feet above the level of the sea.

In the course of conversation at supper, I remarked that Daniel Webster once stated in an agricultural address, that in all countries and in all times, as a general rule, grazing districts had been more prosperous than those devoted to the raising of grain. The next day, while riding with an old resident of the town, a remarkably shrewd and keen observer, he told me that he had traveled a good deal through Duchess county, buying stock, and that the condition of the farmers in the different towns was strikingly confirmatory of Webster's general law. Beginning down the railroad at Rawlings, which was devoted almost exclusively to grazing, the farmers owned their lands clear of debt, they owned the capital stock of their bank, $300,000, and Michigan railroad and other stocks amounting in the aggregate perhaps to $1,000,000. The next town above Rawlings is Dover; this has a little good grain land, though it is devoted mostly to grass. The farmers are generally out of debt, and hold stocks probably to the amount of $500,000. Next comes Amenia, which has a good deal of grain land, though its principal product is the milk of its cows. The farmers of this town own their lands, and about $250,000 in stocks. The next town above is North East, in which Millerton is situated. The land here is about equally divided between grain and grass, and the farmers about own their farms. The next town above is Copake, an excellent grain-growing tract, and the farmers of this town are in debt considerably more than is due to them. Hillsdale, above, is in about the same condition. All these statements apply to the condition of things before the war; since the war commenced the farmers generally have improved their condition, and Copake and Hillsdale have been further benefited by the introduction or sheep-breeding.

I have had the good luck to get into the house of Mr. Daniel Cook, which is situated two miles east from Millerton, a little over the Connecticut line, and just on the summit of a gap in the ridge which divides the valley of the Housatonic from that in which the Harlem Railroad is laid. He has a large, fine farm, and a nice house shaded with magnificent maples, and he belongs to that best portion of New England farmers—the descendants of the old Puritans: these men—industrious, provident, intelligent, conscientious, and obliging—are, in my opinion, the best class of people that are to be found on the face of the earth. As I sit on the piazza writing, I hear the clatter of mowing machines in different directions, and I suppose the same sound is now to be heard across the broad land, from Maine to Nebraska. The mowing machine seems to be universally regarded among farmers as the most valuable invention that has ever been made. Considering that hay is our largest crop, that its harvest comes in the hottest season of the year, and that a man with a machine will cut from ten to twelve acres, while, with a scythe, he could mow only one or two acres, the value of the invention can hardly be over-estimated. I find too, that here, as in Pennsylvania, it is appreciated quite as highly by the women as by the men, it shortens so much the period of haying, and the consequent extra labor for providing for large gangs of men. I am suprised, though, to learn that the reaping machine is considered worthless. It takes so many men to operate it that its use in this region is not profitable. Mr. Cook says that he would not give fifty cents for the best one that ever was made, and though his fields of rye are broad, I see they are being cut to-day by the cradle.

Mr. Cook's farm stretches to the north up the slopes of Taconic mountain, which has given its own appellation to that geological formation, the discoveries in which have made the name of Dr. Emmons immortal; and one fourth of a mile east of this house is the great ore bed from which the famous Salisbury charcoal iron is made. In my next I purpose to give a full description of the manner in which the ore is mined and the iron manufactured. G. B.

A FINE TOWER CLOCK.

The total destruction of the clock in Dr. Tyng's church, Stuyvesant Square, was one among the serious losses by that disastrous fire. The new edifice, however, is to be provided with another, surpassing its predecessor in elegance of finish, simplicity of construction, and certainty of operation. It was built by A. S. Hotchkiss, so well known as a successful clockmaker. It is on exhibition at Messrs. Browne & Spaulding's, 592 Broadway, where all who are interested in mechanism can call and examine it. The clock is so complete and successful a piece of workmanship that a brief description will not be uninteresting.

A solid frame of cast iron, supported by four iron columns, sustains the frame and works, every portion of which is finely finished. The hight of the structure is seven feet. The time main-wheel, three feet in diameter, revolves once in 12 hours. It has the hours painted on its face, and has a pointer denoting the hour of the day. The "snail" is fixed on its arbor and revolves with it. The second wheel is 27 inches in diameter, revolves every hour, has the minutes on its face, and a pointer denotes the minute of the hour. It also has the lifting pin attached to unlock the striking. The 'scape wheel is 8¼ inches diameter, revolving in 3 minutes, with the seconds pointed off. This arrangement of wheels and numbers precludes the necessity of any dial work on the movement. The 'scape wheel has 30 pins of a peculiar shape, designed by Mr. Hotchkiss to prevent the oil being attracted on to the wheel and leaving the pins dry—a source of great annoyance in former pin escapements. The pallets are of the finest agate, and both pins and pallets have the highest attainable polish. The pendulum will vibrate in 3 seconds, making its length to center of oscillation 29 feet 6 inches, or whole length about 31 feet. The weight of the ball will be about 300 lbs. Mr. Hotchkiss has invented a new plan of compensation that has the approval of some of our most scientific men, but as it is so far untried, it may not be well to describe it.

The strike side has two wheels the same size of the time, the third arbor having a short arm and pin to do the locking, and runs through the frame with four fans attached outside. The main wheel has 32 pins with finely-polished steel rollers. For lifting the hammer, three pins are placed in the second wheel, and a pawl that drops by its own weight on the frame, allows the train to move freely forward, but instantly checks a retrograde movement while winding. The second wheel has also near its center three gathering pins. A lever from the lifting pin frees the rack, allowing its arm to drop against the snail; it also unlocks and detains the train until the proper time for striking. Another lever catches the rack by means of an inside ratchet as each gathering pin leaves it, and holds it in position to receive the next, and so on until the end, when it drops into a slot and locks the train. The barrels are 18 inches in diameter, with spiral grooves for wire rope. One maintaining power is self-acting and adjustable to any required strength. The wheels are composition, or gun metal, the pinions solid steel, and the teeth of all are rounded at the bottom to secure the greatest strength. It is intended to run seven dials—three in each tower and one inside the church.

The nicety of fit and simplicity of parts are such that, although in ordinary clocks of this size a weight of 700 pounds is required for power, the time movements are to be driven by a weight of only 150 pounds, and the striking machinery by one of 250 pounds. The weight of the clock is 2,700 pounds and its cost $5,000.

A Poisonous Spider.

A correspondent of one of our exchanges thus describes the effect of a spider bite:—

"The night after the second Bull Run battle, the company to which I was attached encamped at Centerville Hights. The boys were short for blankets, having dropped many of them in their late forced marches. My "chum" and myself had one between us, with which we covered ourselves as we lay upon the bare ground. Soon after lying down I felt something like a bee sting upon my knee. On striking a match I found that I had been bitten by a large gray spider. I immediately took from my haversack a slice of raw pork, and bound it upon the bitten part, and again laid down. But I was soon in such pain that it was impossible to sleep, or even to lie still. The pain, which was at first confined to my knee, spread over my body and seemed to be centering in the pit of my stomach. I never knew before what pain was. In my distress, I started off to find the surgeon; but from the irregular manner in which we were encamped this was no easy job, and before I succeeded, I was in such misery and so weakened, that I could walk but a few steps without falling. One of the guard thinking that I feigned my distress and weakness, told me so to my face, adding that I was merely "scared to death." In a passion, I attempted to punish his impudence, but my anger did not rally my strength, for as I made at him I fell, and he escaped. Dr. Merrow, who examined me, said it was a bad case. He immediately gave me some medicine to take, and something to apply to my knee, and left me with directions to come to his tent again in half an hour if I was no better. At the expiration of that time I could not stand, and Sergeant Vickery carried me to the doctor, who told his assistant as soon as he saw me, that it was of no use to do anything further, as I should die before morning. Unwilling to see me die without doing any thing more, the assistant said to the doctor, "You know what we gave him before—that did not hurt him, shall we try another dose?" The doctor assented. On giving it to me they said "there is poison enough to kill seven well men." I told them I would take it, for I did not care how soon I was out of misery. After taking it they told me to lie down and keep quiet, as that was all they could do for me. In the morning, as I could not stand, I was put in an ambulance and sent to the hospital at Washington, where I remained two months before I was able to rejoin my regiment, and was in the train but a short distance from General Kearney when he was killed. Even to the present day I have not fully recovered, as whenever I take cold something of the horrible sufferings which I endured from that venomous bite returns upon me."

Boots and Shoes.

The value of boots and shoes manufactured in the United States, in 1865, at wholesale, amounted to $95,500,000, and in 1818 to not as many thousands. It was about this time that Rufus Chapin, of Milford, Mass., conceived the idea that boots and shoes could be made with pegs, and be as durable as if they were sewed. Acting on the idea, Mr. Chapin at once commenced the manufacture of pegged boots, splitting the pegs by hand from strips of wood, sawed by his direction into different lengths. This was the first introduction of pegged boots into this or any other country. He continued to manufacture pegged work successfully until his death in 1839; and this branch of manufacture has grown so rapidly that it now stands third on the list of manufactured articles in the United States. Mr. Chapin had five sons, who, from boyhood up to the present time, have continued in the business.

ALL the manufacturing establishments at Columbus, Ga., burnt during the war, are being rapidly rebuilt. A heavy New York firm has recently completed a rolling mill, which will be one of the first establishments in the whole country of that kind. The city bears but few traces of the ravages and devastations of the war.

THE MANUFACTURE OF HAIRCLOTH.

Until within a recent period the haircloth, so extensively used in upholstering, was brought from foreign countries, mainly from Germany. The manufacture has, however, become a noticeable element in our mechanical progress. Haircloth of superior quality is now manufactured in this country. There are two general uses to which it is applied—one for ornament, or outside exposure, and the other for utility, merely. For the stiffening of fabrics, in which it usurps the place of the old-fashioned, unyielding buckram, known so well to the last generation as a means of giving the vertical rigidity to coat collars, demanded by the fashion of the day, it is even now extensively employed. In this case, where the fabric itself is concealed, it does not matter what its color may be, and no preparatory means are used to give a particular color to the hair.

For upholstering purposes, however, the fashion of the day demands a brilliant black. We can well remember the time when sofas and chairs were covered with a parti-colored fabric, composed of black and yellowish white hairs, disposed sometimes to form a regular pattern, but often used indiscriminately, making an unequal mixture of tints. Latterly, however, the demand has been for a uniform tint of brilliant black.

The woof or warp of hair cloth is of linen, cotton, or worsted. Most of that in general use is of cotton. Silk has been used to give additional luster and strength, and linen was substituted for silk for the same reason; but the looms for weaving are now constructed so that the upper surface, or "right side," contains four-fifths of the hair, giving the necessary luster and avoiding the requisite of a brilliant warp.

The hair used is horsehair, and is obtained from Tartary, the Ukraine, or Buenos Ayres, South America. Black being the favorite color, the manes and tails of the Ukraine horses are preferred, although the hair of a lighter shade can be dyed to a brilliant black. Apart, however, from the extra trouble and expense, dyed hair does not hold its brilliancy so well as that of a natural color, and is apt to grow "rusty." The width of the cloth is governed by the length of the hairs. It is rare, indeed, when these can be found measuring forty-two inches, generally far less. The wider the cloth the more valuable the fabric.

The hair, as imported, is assorted in bunches of nearly uniform color and length, and then further assorted and arranged by hackling. The hairs, being thus separated as to length, and divided as to color, are fed into the loom by hand. This has been heretofore the uniform practice, but the weaving has been improved by substituting mechanical devices for feeding the hairs. In Pawtucket, R. I., and perhaps in other places, a device for supplying the looms has been in use for several years. The result is far preferable to the old-fashioned method, and adds much to the capacity of the looms and the quality of the fabric.

The shorter hairs, which are unfit for weaving into cloth, are used for making horsehair mittens for rubbing the surface of the body, or are twisted into ropes, which, after being steeped in water, are baked in an oven, the heat of which fastens the twist of the hair and gives it that springy elasticity which makes it so popular as a stuffing for chair seats, sofas, and beds.

Heavy Forgings.

The most interesting and one of the most important problems in the production of heavy masses of wrought iron is that of the manufacture of large naval guns. Steel appears to be quite unsuited to the requirements of large-bore ordnance, and cast iron, despite the American practice, is a material upon which no one in this country would, we think, like to venture. As for wrought iron, it has a greater dynamic resistance than steel, that is, what it wants in tensile strength it makes up in extensibility. It may require a steel inner tube, but rather to prevent the percussive action of the powder gases upon the wrought iron than as a direct provision against bursting.

There are three modes of working by which we may expect to make perfectly sound iron forgings of any weight. The first is the forming of the pile from bars or slabs which have been surfaced by machine cutting, either planing, turning, boring, or drilling, as the form of the parts may require. This mode is followed by Mr. Ames in the manufacture of his guns, and it obviously affords a complete guarantee against flaws, etc., in the parts of which the pile is formed. The second point is to heat the pile wholly by gas, as in the regenerative furnace. In this furnace the iron may be almost melted, but never burnt, as it is exposed only to heat, and not to an oxidizing flame as in a common heating furnace. With clean surfaces to begin with, and a bath of intensely hot but non-corrosive gas, the iron may be made as plastic as the softest wax, and its perfect welding may be insured. This is attended with no loss or injury by burning, and for large masses and quantities of iron there can now no longer be any doubt that the gas furnace affords also the cheapest as well as the best mode of heating. The third point in forming large forgings is to subject them to sudden and powerful hydraulic pressure, as may now be done by the various hydraulic forging presses, one of which, as now fitting at Messrs. Platt Brothers', at Oldham, we not long since illustrated.

Experience has shown that the forcible pressing together of clean surfaces of wrought iron at a white heat insures perfect welding, and is, in fact, the next thing to founding in wrought iron. Wrought iron, when sufficiently carburized to be fusible, is commonly called "homogeneous metal," and in this form it appears to be wanting, too, in dynamic strength, although it is believed to be stronger in this respect than cast steel. Great pressure is of very great value in the case of steel ingots. Mr. Ramsbottom has greatly improved the quality of Bessemer ingots by squeezing them in his enormous "cogging machine," which we illustrated a few months ago (Vol. I., p. 42). Mr. Whitworth is, we believe, about to employ great pressure in the manufacture of cannon; and Messrs. Firth & Sons, of Sheffield, are also about pressing cast-steel shot. The advantages might not prove wholly of the same kind in the case of pressing wrought iron while hot, but it would secure perfect welding where, by the means pointed out, care had been taken to prevent the formation of scale.—*Engineering.*

Granulation of Blast-furnace Slags.

For the past two years the granulation of blast-furnace slags has been successfully accomplished in France, the whole of the inconvenience usually arising from the accumulation of masses of vitreous matter being thus avoided. The slag is simply permitted to run into water instead of running upon the ground, as usual. The water used is the waste from cooling the tweers, etc. A suitable pit is formed to receive the water, and the molten slag is run through a gutter into it—of course, becoming finely divided and friable. The slag-sand is raised by an endless chain of buckets, and removed in carts, or otherwise. It is useful for making mortar and silicious bricks, as well as for agricultural and a variety of other purposes. The invention of the process is due to Mr. Minary, and may be seen in use at the works of the Franche-Comte Forges Company, in the department of Jura. The sands vary in color from dingy-gray to dark brown or black, and weigh about 1,200 kilogrammes the cubic inch.—*London Mining Journal.*

LOCUST STINGS.—The Greensburg (Pa.,) *Argus* says that Wm. Kettering, of Hempfield township, was stung in the neck by a locust, a few days ago, while plowing, and was compelled to take to his bed, suffering great pain. Two other cases of stings by locusts are also said to have occurred in Pennsylvania, one of which proved fatal. If these instances are well authenticated, they should be a warning against handling the pests.

QUICK WORK.—On the 30th of June we forwarded to our agent, in Paris, the necessary papers for two French patents. The applications were immediately filed, and certificates of allowance were issued on the 13th of July. On the following 24th we received the certificates at our office. This is what we call doing business with dispatch.

MISCELLANEOUS SUMMARY.

NEW CAR-WHEEL FACTORY.—Messrs. Davenport, Fairburn & Co., of Erie, Pa., have lately put in operation in that city, a large concern for the manufacture of car wheels and other railroad castings. The wheels are said to be very superior. The Erie *Daily Dispatch* says: "Human muscle and sledge hammers have no more effect upon these wheels than a drop of rain upon a granite rock. They have been put to the severest of tests, and so far it has been found impossible to break them by any ordinary method. And after the works were put in full motion, but one wheel in one hundred and twenty was condemned as imperfect."

MESSRS. A. T. STEWART, W. B. Astor, C. Vanderbilt, and H. B. Claflin, four of New York's leading wealthy men, will return and pay together on ten millions of private income, exclusive of the taxes on the large mercantile business of two of these gentlemen. The same parties for 1864 paid on not more than four millions. It is said that Stewart's income last year amounted to $4,700,000. If Stewart lives long enough, and observes economy, there is a reasonable prospect that he may have a handsome property.

PETROLEUM FROM CANNEL COAL.—The *Mining Journal* says that there are four companies in New South Wales employed in extracting oil from the cannel coal found about seventy-four miles from Sydney. The coal yields from 40 to 150 gallons of oil to the tun, and it is estimated that it can be extracted, refined, and delivered in Sydney at a cost of about 1s. 8d. per gallon.

A GOOD OLD STOVE.—A correspondent writes that John Hamilton, of Clark county, Ind., has a stove made at Elizabeth Furnace, Va., in 1769. The date and name of furnace are yet quite plain on the stove, but rust has obliterated the maker's name, so that it cannot be made out. It has been in Mr. Hamilton's possession 35 years, and is yet a good stove.

LOUISVILLE, Ky., is reviving from the lethargy into which the war had plunged her, and her founderies number forty concerns, principally workers in iron, copper, and brass, giving employment to 1,700 hands, and employing a capital of $2,500,000. The amount of coal consumed is 4,000,000 bushels per year.

A COTTON manufacturing company has been organized at Cuthbert, Ga., of which Mr. John Hardie, of Eufaula, Ala., is President. The factory is to be two stories high, with a width of 125 feet and a length of 300 feet; $500,000 of stock has been subscribed and $150,000 paid in.

SAWING OFF LEGS.—In a Berlin military hospital they perform some amputations with circular saws. A fine toothed saw running at a high velocity, would sever a limb instantly without making a ragged cut, but we presume the "flaps" are made first with the knife, as it could hardly be done with a saw.

CEMENT.—A correspondent suggests that a cement for mill stones, nearly as hard as stone, and one that dries quickly, can be made by mixing together, like mortar, lime, cottage cheese (which is known in Germany as *schmier kase*), and white sand, in proportions best determined by experiment.

THE assay of the gold from the rich mine of gold and silver discovered recently in Ulster County, New York, in the Shawangunk Mountain, which was made at the Philadelphia Mint, and certified to, proves the quartz as rich as that of Colorado.

DRAUGHTSMAN ON WOOD.—A good designer and draughtsman on wood—one capable of doing first-class mechanical work—may find constant employment at the office of this paper.

THIS is the season of rapid passages over the Atlantic. The *Scotia*, an English iron ship, made the voyage from Queenstown to this city in 8 days and 17 hours; the fastest trip on record.

SAFES IN THE PORTLAND FIRE.—We are assured by the manufacturers that all of the Herring safes which were exposed in the Portland fire, withstood the elements, and protected their contents.

A PARTRIDGE recently struck a telegraph wire near Forres, France, and had its head cut clean off.

BOATS float when ships founder.

THE ADVANTAGE OF GOOD TOOLS.

Next to a practical knowledge of his business, the mechanic needs proper appliances and tools for its prosecution. It is an old saying, but hardly a correct one, that "a poor workman can use good tools, but only a good workman can perform a job with poor tools." The fact is that no workman can afford to use inferior and inefficient tools. "Makeshifts" can never usurp the place of proper tools. There may be cases when the mechanic is compelled to do a job without the appropriate instruments, but the result is seldom satisfactory, and if the desired end is attained, it is reached by an expenditure of muscle, time, and contrivance that robs the workman of half his gratification. He may exhibit his ingenuity and perseverance by persisting in the employment of inadequate means, but he does so at the expense of valuable time and energy, which could be more profitably used.

The rapid and constant improvement in tools and labor-saving contrivances, has greatly lightened the labors of the workman and increased the profits of the manufacturer. The mechanic who learned his trade twenty years ago, would be ashamed to do his work with the appliances which then were considered the best. He has been compelled, year by year, to forget the cunning of hand that alone made his crude tools efficient, and has had to learn the use of this improved tool and understand the advantages of that new process. But the lesson has carried its advantages with it. Possibly there is not so much necessity for the exercise of manual dexterity, but the proper adaptation of the means to the end, the stimulation of his ingenuity by recognizing the advantages of improvements already made, the pride in the results of his work—results gained by the use of tools perfectly adapted, and the rapidity and precision which are a consequence—more than repay him for the trouble of keeping up with the times.

Nor will these remarks apply to the mechanic alone. There is no branch of productive industry that has not felt the impetus of improved tools. The farmer who would now endeavor, with the implements he used fifteen years ago, to compete with his neighbor who selects from the agricultural ware house the best tools, will fail in his attempt, or succeed at the expense of unremitting toil and a life of slavery. In short, the enterprise and intelligence of the producer are shown more in his choice of means than in his industry and perseverance alone. Undoubtedly some of the devices for facilitating the processes of labor are any thing but improvements, but he who would reject all new inventions because some are failures is not wise. One has only to observe some one of the many new appliances now in use in any department of industry, and compare it with that which subserved a similar purpose a few years ago, to be convinced that in no branch of improvement has ingenuity been more usefully and beneficially employed than in the invention of new tools.

The apprentice at any business should be furnished with the best of tools and taught how to use them. It is poor economy to compel him to drudge with dull or worn-out tools, or those unsuited to his strength and inexperience. He becomes disheartened and disgusted with his business. Better he should ruin valuable tools than that he should be compelled to work with unsuitable implements. Let him be taught how to use and keep in order his tools and he will soon come to value them and feel an interest in his occupation. It is a wise economy to "use the best," as the nostrum venders advise. Whenever an improved implement comes into the market which will do the work required quicker, or better, or with a less expenditure of strength, it will pay to reject the one in use and procure that.

Fleas.

Probably no annoyance from purely natural causes is so vexatious as that caused by fleas. Some districts are by them made almost unfit for human habitation—totally unfitted for human comfort. We have read one of Judge Haliburton's volumes of the Yankee Clockmaker in which "Sam Slick" stated that a common herb was a specific against their attacks, but through a strange perversity he neglected to say what it was. We believe it is the common pennyroyal. The oil of this herb, or, if that is not readily obtainable, an infusion of the herb in water, will banish the pests. We hope some of our readers will give it a stronger test than circumstances have enabled us to do, and let the readers of the SCIENTIFIC AMERICAN know the result.

INFLUENCE OF THE MECHANIC IN POLITICS.

Material force, embodied in vast aggregations of men, as armies or large fleets of warlike vessels, was once the instrument by which one nation sustained its influence or extended its power at the expense of others. This was the age of brute force. By it the Roman Empire ruled the known world. The Roman generals and statesmen were but the guiding and controlling agents of Rome's vast military power. Force, physical force, gave her the great preponderance of power which accords to her the fame of the strongest nation of antiquity. Her workers were either slaves in reality and by the force of law, or they were so by the force of circumstances. The soldier and not the artisan represented Rome, in an embodiment of force.

In the lapse of time all this was changed, and brute force gave way to its master, the intellect. Diplomacy undertook to do what arms before had accomplished, and until the present it is greatly relied upon to retain or extend the power of nations. But behind it is the principle of material force. "Might makes right" is the guide of diplomats as of unscrupulous generals.

A new era has introduced the mechanic and the inventor as an agent in the affairs of the nations. The nations rest their lease of power and designs of enlargement, either of territory or influence, directly upon the intelligent mechanic. This fact was exemplified in our late war, when the inventive talent and the readiness in contingencies of the *materiel* of our armies, enabled us to overcome natural obstacles and to repair hostile devastations with certainty and rapidity. Was a swollen stream to be bridged, an unfathomable and treacherous morass to be made passable, or an oversight to be remedied—the mechanical talent of our soldiers furnished the brains and sinew to do the work. As much was due in the general result to the skill and practical knowledge of our citizen soldiers, as to the combinations of generals or the pertinacity of leaders.

But we had another element of success, also due to the inventive talent and useful workmanship of our mechanics. Untiring industry and stimulated genius gave us the Rodman and Parrot gun and the Sharp and Spencer rifle. These were indeed "sickles of death"—patent reapers in his gory harvest. To their efficiency the result of more than one battle is due. Victory attended the labors of our intelligent mechanics. To them as much as to any human agency are we indebted to-day for a united and free country.

The present European war has, so far, given us another proof of the important position of the mechanic in the affairs of the governments The Austrian army was as well drilled, disciplined, and supplied as that of her adversary. The cause for which either was fighting could not be counted upon as a means for infusing enthusiasm into the rank and file. Both had good leaders, and in all respects, save one, the forces were equal. That one was a superiority given by the inventor and the mechanic. They won the victories for Prussia. The irresistible needle gun, inferior to our best breech loaders, but vastly superior to the best muzzle loading piece, drove the Austrians from one position after another, until at the battle of Sadowa the Austrian army was dispersed in a rout, and the fate of the Austrian empire almost decided.

The mechanics of a country have a right, under such circumstances, to arrogate to themselves a proud position. They are, and will be, the arbiters of the nations. The governments in time of peace are strengthened and sustained by their labors, and in time of war defended by their skill. The genius of the mechanic unravels the Gordian knots which the pen of the diplomat fails to loosen. The Patent Office is as valuable as a means of preparation for war as West Point or the Naval School.

An Unfortunate Inventor.

A deplorable incident occurred in the Bay of Valparaiso in May. A German, named Flach, having constructed a torpedo-submarine boat, made several successful experiments in sinking and raising his boat in four fathoms water. He then took a party of friends on board, and with them proceeded some distance out in the harbor, and there sunk his boat, with himself and friends on board, in 30 fathoms. No anxiety was felt about the expedition for some time, Flach having stated that he could remain under water easily for the space of six or seven hours, but as the boat did not make its appearance about this time, considerable anxiety was created, and as evening advanced the anxiety increased. Unfortunately, Flach was so confident in the success of his experiments that he would not allow any buoy or rope to be attached to the boat, and thus no search could be made for them with any certainty of success. Every effort to find them was made by divers and otherwise, but no traces were found until five days afterward, when a diver discovered the boat, but at such a depth as to render it impossible for him to make a rope fast to it.

CHEMICAL NOTES.

ARTIFICIAL DIAMONDS.—This old subject is again reviewed by M. Charcourtois, who believes that the diamond is formed in consequence of the decomposition of hydrocarbons, just as free sulphur results from the decomposition of hydro-sulphureted emanations.

He suggests the following process:—Submit a very slow current of marsh gas or a hydrocarbon vapor accompanied by the vapor of water to a very mild oxidizing action in a mass of sand containing putrescible matter, flour for example. The author admits that this process has been going on under our noses for years past, and thinks that diamond dust may be found in the black earth that surrounds the gas pipes where they leak under our streets.

NEW SOLVENTS OF GOLD.—M. Nickles shows that iodine under pressure, or even under the influence of light, will dissolve gold leaf. The sesquiiodide and sesqui-bromide of iron also act as solvents.

GUN-COTTON.—Extensive experiments are in progress at Woolwich, England, with a view of examining fully into the extent of liability to change of gun-cotton when in storage or exposed to light and heat. The results hitherto arrived at, though they have shown that under severe conditions gun-cotton is liable to decompose, have not confirmed the conclusions arrived at by French chemists with regard to the great instability of this material. At Woolwich no instance of rapid decomposition has been noticed. It has been determined by experiments that gun-cotton can be preserved perfectly by immersing it in water or impregnating it with water sufficiently to render it uninflammable, in which condition it is much safer than gunpowder.

PRESERVATION OF LEMONS.—A correspondent states that lemons may be preserved by the very simple process of varnishing them with a solution of shellac in spirit of wine. Fresh lemon juice is thus obtainable at all seasons of the year; and if the peel be required for flavoring, the skin of shellac may be easily removed by simply kneading the elastic lemon in the hands.

ALUM IN IRON SAFES.—A Vienna manufacturer makes fire-proof safes, in which a certain space is filled with powdered alum. When the heat reaches this, the water of crystallization is driven off, by which a great absorption of heat is produced and the temperature of the interior of the safe kept proportionately low. For ten years we have had an alum filled safe in our office. Ammonia alum is also used for the same purpose in England.

PREPARATION OF BONES FOR MANURE.—Illienkof, a Russian chemist, gives the following process, which, it is said, has received the approbation of Liebig:—The author mixes say 1,000 parts of ground bones with 1,000 parts of wood ashes containing 10 per cent of carbonate of potash, and adds 600 parts of quicklime. This mixture he places in a tank or fosse with water sufficient to make the whole moist. In a short time the bony matter is completely disaggregated by the caustic potash, and the pasty mass formed is then taken from the tank, dried, mixed with an equal weight of mold, and is then ready to be distributed. We can easily believe that a preparation of this kind is a far better manure than superphosphate.

TELEGRAPHIC CABLE.

A correspondent sends us a description of a submarine telegraphic cable, herewith illustrated, the invention of Prof. A. J. B. De Morat of Philadelphia, for which he has taken measures to secure patents in this country and in Europe. We give the ideas of our correspondent.

The causes of the failure of the cable of 1858 are yet wrapped in mystery. It is stated that at the depth of two miles the hydrostatic pressure of the water is 4,000 lbs. per square inch. The larger part of the present cable (see Fig. 4,) is composed of india-rubber or gutta-percha, jute, tar rope, or other similar material. Such a body must suffer compression under so great a weight, and will be extended in length. By calculation it is found that a cable one inch in diameter with a set of wires coiled about it four times in one foot, and reduced by the pressure a thirty-second of its diameter will increase in length between four and five hundred feet per mile. The center or conducting wires, being straight, could not yield sufficiently and retain their connection under such an extension. It would be difficult to ascertain if this was really the result, as upon bringing the cable to the surface the tension would be relaxed and the ends of the separated conductors might come together and the current be restored. A strict analysis of the cable would alone determine the fact.

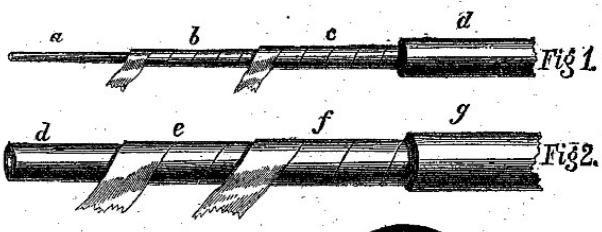


Fig. 1.

Fig. 2.

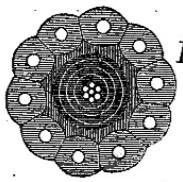


Fig. 4.

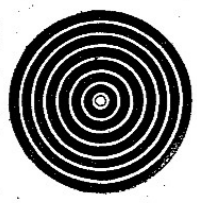


Fig. 3.

Fig. 1, letter *a* represents an iron wire about 1-16th of an inch in diameter. Over this is wrapped tightly a very thin copper ribbon, in width 1½ times the diameter of *a*, as represented at *b*, then on this is wrapped, as tightly, a similar copper ribbon, being careful to cover the joints of the first, as at *c*. This is covered with a compact coating of india-rubber or other insulating material, as at *d*. Then wrap this with copper ribbon, in width 1½ times the diameter of *d*, as at *e*, Fig. 2, and this with another similar copper ribbon, covering the joints as before, as at *f*, and covering again with some insulating material, as at *g*. This process is continued until the desired number of conductors is obtained. In Fig. 3, *h*, we have an end view of a cable with six conductors, and an outside one to neutralize all earth currents.

Each of these double copper coils, *b c*, *e f*, etc., by the compact manner in which they are put on, become perfect copper cylinders, one within the other. Any compression of these cylinders only tends to lengthen the coil and never to break or sever connection. Being insulated from each other, each is an independent conductor and can be attached to its own instrument. The outer cylinder, by having a battery of any required strength attached, can neutralize all earth currents, and protect and equalize all the conductors within. In the experiments with these cables no inductive currents have been detected to interfere with perfect transmission of direct currents or telegrams. If there are any inductive currents, we may hazard the theory that they occur on the inner surface of each respective cylinder, and are thus rendered inoperative. Be this as it may, time will soon prove its fallacy or establish its correctness. Experiment has proved one fact, that the transmission of the electric fluid is perfect through each cylinder at the same time.

The advantages claimed are: First, It is lighter, and possesses remarkable strength for its weight. Second, Is more pliable. Third, Is more elastic, the conductors being the last to break. Fourth, Has many conductors, each being independent. Fifth, It can neutralize all earth currents. Sixth, Its power to transmit is not weakened by any inductive currents.

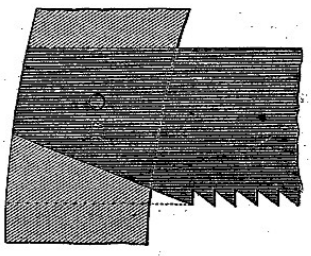
Out of thirty-five safes opened by one machinist, in Portland, since the fire, only five were found to have been really safe.

Correspondence

Saws and Saw Filing.

Messrs. Editors:—I saw some mention in a late number of your paper of a saw-filing hand-book or manual. Was it "Holly's Art of Saw Filing?" As yet I have never met with any other. Do professional saw fliers or makers agree with him that the handsaw for cross-cutting purposes should be filed with the point of the file inclined toward the point of the saw, which is contrary to the common practice of carpenters in this part of the world? I have always supposed the file should, in its motions, meet the cutting edge of the tooth, in the manner the surface of the grindstone meets the edge of a chisel or plane iron.

I would like to suggest to saw makers that if the blades of billet or buck saws were made at the ends in shape like the accompanying outline, it would be



much easier to keep them in order. The hole should be punched about one-third the distance from the upper or back edge instead of in the middle of the blade.

I find great inconvenience after a saw has been worn in keeping the teeth straight on account of the uncut portions of the blade projecting below the line of the teeth. Sometimes, with a heated pair of blacksmith's tongs, I draw the temper from the ends of the blade and cut off the useless portion, or I file a cut on each side and break it off on the edge of a block of iron or hard wood. R. E.

Kansas City, Mo.

[We referred to Holly's work. On pages 20 and 21 he gives excellent reasons for filing toward the point. The value of his plan can be easily tested practically.—Eds.

Millstone Cement.

Messrs. Editors:—I saw an inquiry in your paper of July 14, 1866, for a cement for millstones. Well, I can tell you what I use. I am an old miller and have been running flouring mills in this place for the last thirty years, and I never found any thing any better. Take burr block and powder it fine, and take equal parts of powdered burr block, alum and borax, melt and pour in the holes; this is next to the burr in hardness. But I prefer not to put any thing in at all; it does not do any good, it will not grind any thing, the holes do not hurt any thing, as they fill up with flour while grinding. I have had great experience in the milling business. We are running three mills out of seven in this city, I built the first mill in this city some thirty years ago. I am a constant reader of your valuable paper and would not do without it. A. Hick.

Springfield, Ill., July 16, 1866.

Cement for Mill Stones.

Messrs. Editors:—In return for much pleasant reading and useful information derived from your journal, I am happy to be able to reply to your inquiry for "a cement for mill stones." I used the following some twenty-five years since, in my steam mill on the Ohio River, viz: Take about equal parts of common alum, pulverized, and pieces of broken china, also pulverized; put the alum in an iron vessel over a hot fire until it becomes liquid, then stir in the powdered china, or so much of it as will still leave the combined mass semi-liquid, then, while yet hot, pour or plaster it into the cavity; it will soon cool and become as hard and immovable as any part of the mill stone. E. A. T.

Huntingdon Valley, Pa., July 16, 1866.

Keeping Circular Saws in Order.

Messrs. Editors:—In Vol. XV., No. 4, page 51, of the Scientific American, an article written on this subject by Mr. A. S. Pettigrew, gives some valuable information, but it seems to be confined to a particular class of saws, viz., large saws for sawing lumber from the logs or square timber.

In an article written by myself, May 26th, and published in the Scientific American, page 360, I recommend running a circular saw nine thousand feet per minute at the rim. (In the article it reads nine hundred which was an error; it should have been nine thousand.) Mr. P. ridicules the idea, and makes an assertion of his own without giving any reason or rule. Now, I did not recommend, as he states, running the rim of a circular saw two miles a minute; I merely stated that a saw running nine thousand feet per minute was traveling nearly two miles per minute.

Mr. P. says that four hundred and fifty revolutions per minute for a sixty-inch saw is enough. Why does he not give his reasons? Mere assertions of one man is not proof. It is well known to the best millwrights that a sixty-inch saw will run with safety at six hundred, and they have been run at seven hundred and fifty. Thirty-six-inch shingle saws are very commonly run at twelve hundred revolutions per minute, and sometimes at fifteen hupdred.

Mr. P. also asserts that a saw should be filed every one thousand feet of lumber sawed; and says that the five minutes occupied in filing is the most profitable five minutes of the hour. But suppose a saw is cutting three thousand feet of lumber per hour, then it would take him one-fourth part of the time to file his saw. I know of mills that saw, as an average, with one saw, from three to four thousand feet of good lumber every hour, and from four to six thousand feet without filing. I know of other mills that cannot saw one thousand feet without filing.

Of clean pine, hemlock, poplar, or other soft timber, from two to six thousand feet may be sawed profitably at one filing—other timber that has lain on river banks, sun-cracked, and rolled through the dirt and sand into the water, with the deep sun-cracks full of grit, or square timber that has been hauled through the mud, and every crack and crevice, and score hack dragged full of mud and sand, and often only one side of the teeth cutting (or rather one corner) just trimming off the side of the stick and striking fire as it goes—I think Mr. P. will agree with me that it will not be profitable to keep the points of the teeth of ordinary saws, where the teeth are made no thicker than the plate, spread to give them the required set in sawing such lumber without bending. Millions of feet of such timber are sawed annually. I think the wisest rule was given by King Solomon when he said: "If the iron be blunt, and he whet not the edge thereof, put to the more strength;" but wisdom is profitable to direct any man's judgment, and can guide him better than any fixed rule when to file his saw, without sawing just one thousand feet of lumber and then stopping to file.

Mr. P. also writes as though end motion made no difference with the running of a saw. I have seen saws do very good work with end motion, and when he takes exceptions to Mr. Ritchie's advice of

changing the lead of the saw, he virtually admits that end play is really detrimental, for it will be seen at once that if the rim of a saw is held in one position firmly in the guides, and the center allowed to move either way, it changes at once the range of the saw from a direct line. The very fact that saws are run and sawing lumber day after day, without end play and doing good work, ought to be sufficient proof that end play is useless.

I agree with Mr. P. that a saw will work better to spread the teeth for the set without bending them in clean lumber, but in gritty lumber I do not think it will pay. I trust this interchange of views will throw light on this important subject, and that you will continue the correspondence from practical men. J. E. EMERSON.

Trenton, N. J., July 24, 1866.

Mills for Grinding Paints and Printers' Inks.

MESSRS. EDITORS:—We are job printers, and manufacture the greater portion of our colored inks, of which we use large quantities. The mill we use for grinding is the well-known Harris Paint Mill, only we have the hopper and runner made with a larger grinding surface than is required for paints. The entire mill is of iron. In grinding yellows, blues, carmines, lakes, and, in fact, every color except vermilion, we have no difficulty, but in grinding vermilion, the color changes to a dull brown. Now what is the cause of it? Is it the heat of the mill, the iron rubbing off, or does the iron oxidize? This is what we wish to know.

A marble mill would be the proper one for grinding printers' ink, and one made on the plan of the Harris Mill, with more grinding surface than is required for paints, would be the thing. Do you know of anything of the kind, and where they can be procured? JAMES LUCUS & SON.

Baltimore, Md., July 11, 1866.

[Vermilion is a compound of mercury and sulphur. Being a sulphuret of mercury the sulphur would probably leave the mercury and combine with the iron of your mill. The heating of your mill, also, by friction, may impair the color of the vermilion. Sometimes when over-heated the color may be restored by a bath of warm water. Possibly the Harris Mill, of brass, driven at a low rate of speed, might grind your vermilion leaving its color intact. We can conceive no reason why marble could not be substituted for metal in the grinding surfaces of these mills, but we are not aware that any mills are made of this material. We would not recommend iron in any case for grinding delicate colors, as yellow, blue, or green. Composition or gun-metal is certainly preferable.—EDS.

The Heating of Guns by Concussion.

MESSRS. EDITORS:—In confirmation of the theory of Professor Seely, respecting the heating of gun-barrels, I would like to make known, through the SCIENTIFIC AMERICAN, some facts in my own experience. One of the early forms of metallic cartridge had a central aperture, about one-tenth inch diameter in the base. The escape of powder and the entrance of moisture were prevented by a thin paper disk, saturated with melted beeswax and placed on the bottom, inside. Ignition of the powder was produced by fire from the percussion primer or cap passing through the paper.

Now for the facts I would call attention to. This thin waxed paper was never burned, nor was there even a scorching of the ragged edges around the rent made by the percussion primer.

The attentive reader will find the explanation given fully in Professor Seely's article in your journal of the 7th inst. EDWARD MAYNARD.

Tarrytown, N. Y., July 7, 1866.

[The masses of iron which were burst by nitro-glycerin in the experiments at Washington, reported in the SCIENTIFIC AMERICAN of July 21st, were said to have been very much heated. In this case the contact of the burning material with the iron was much shorter than is the case in the firing of a gun.—EDS.

Cementing Tin and Glass.

MESSRS. EDITORS:—Is there any cement not affected by ether which will unite tin and glass? I have tried several cements, but the ether seems to destroy them. I would prefer something like plaster of Paris—mushy—that would set and harden quickly. T. E. L.

Cincinnati, Ohio.

Foreign Items.

A FEAT of almost unrivaled traveling was recently accomplished on the Great Northern Railway. On the occasion of the late fire at Newcastle, when the safety of the high-level bridge was endangered, a telegram was sent to London requiring the attendance of Mr. Harrison, the engineer of the North Eastern Railway Company, and that gentleman was conveyed by an engine belonging to the Great Northern Company from King's Cross to York, a distance of 191 miles, in 3 hours, 43 minutes, including a stoppage of 8 minutes at Newark for water and lubricating the engine—*Mechanics' Magazine.*

BY a very simple apparatus, invented by Captain Anderson, every part of the bottom of the *Great Eastern* was thoroughly scrubbed before she started on her present expedition. How much this was wanting may be judged from the fact that in many parts the muscles were in clusters of more than two feet thick upon her. Getting rid of this rough, shapeless mass from under her entire length will add at least a knot an hour to the vessel's speed.

OF the total heat given out by the combustion of the food, a man can make a fifth available in the form of actual work, while it has never been found possible to construct a steam engine that could utilize more than a ninth of the energy of the fuel burnt under the boiler.

COMMANDER WARREN has patented a plan for stopping shot holes or leaks in iron ships by sheets of lead fastened over the damaged part by means of screws acting on the outside of vulcanized india-rubber suckers.

MR. EUGENE TERRY, of New York, and M. Ernest Watelet, of Paris, have first made the ascent of Mont Blanc for this season with perfect success. They were accompanied by Edouard Cupelin, the well-known guide.

CONSIDERABLE deposits of bismuth in combination with copper are found in New Zealand; and it is said that an effectual and economical process for the separation of the two metals has been devised.

THE consumption of petroleum in Europe in 1864 was 30,000,000 gallons, against 16,000,000 in 1862; the probable consumption in 1866 is estimated at 90,000,000 gallons.

THE amount of pig iron exported to England by the American Colonies from 1728 to 1768 was about 75,000 tuns, of which 26,000 were exported from 1761 to 1768.

NEW INVENTIONS.

The following are some of the most prominent of the patents issued this week, with the names of the patentees:—

MACHINE FOR PRESSING AND MOLDING PEAT.—M. B. STAFFORD, New York City.—This is a machine for pressing and molding peat in an expeditious manner and by a continuous rotary motion of the driving shaft; it consists of a framing, at each end of which there is a roller for an endless band or chain of molds to pass over. A plunger is arranged to work into the molds as the latter pass underneath the former, and a hopper is placed over the molds from which they are supplied with peat before they reach the plunger.

SEWING MACHINE.—A. WARTH, Stapleton, N. Y.—This invention relates particularly to improvements in the Wheeler & Wilson sewing machine, whereby the needle feed is adapted to said machine, and various defects in the construction of these machines are obviated.

STEAM PACKING.—FRANCIS WRIGHT, Galesburg, Ill.—This invention relates to a packing which is intended particularly for piston rods of steam engines, and which requires little attention, and works with the least possible loss by friction.

BLACKING CASE AND NIGHT CHAIR.—J. H. DOUGHTY, New York City.—This invention relates to a blacking case which is arranged in a suitable box under the seat of a chair, stool, settee, or other similar article. In the same box, and under the blacking case, may also be placed a dressing case and a night chair of suitable construction, and so arranged that its cover closes down tight to prevent the escape of unpleasant odors. Under the box is a boot-jack, which is made to slide in and out, and another boot-jack may be hinged to the side of the box or chair.

SPINNING JACK.—GILBERTH DAWSON, Rockville, Conn.—The object of this invention is to stop the roping or roving drums from slipping around or continuing their rotation after the roping gear has been disconnected.

COLLAR FASTENING.—JAMES PROUD, New York City.—This invention relates to a novel fastening for attaching or securing a collar to a shirt, with which all danger of soiling or injuring the collar is prevented.

WHEAT DRILL.—GEORGE ZORGER, Greensburg, Ind.—This invention consists in certain modifications and peculiarities of construction, whereby several important advantages are obtained.

FORCE PUMP.—EDWARD B. HARRIS, Wilmington, Ill.—This is a double-acting force pump, by which water may be elevated with a very moderate expenditure of power, and with a simple arrangement of parts.

QUARTZ CRUSHER AND PULVERIZER.—JOHN MARKS, Isle Royal Mines, Lake Superior, Mich.—This improvement consists in the arrangement of a feed table which revolves between the wheels, at a less speed, and on which the quartz is fed in such a manner that by the action of said feed table the quartz is easily distributed and exposed to the action of the mullers.

HEAT REGULATOR AND DAMPER.—JOSEPH A. JACOBS, Pittsfield, N. H.—This invention relates to a regulator or damper which is made in the form of a double grate, the two parts of which are connected by a sliding crank shaft, in such a manner that by turning the crank shaft the bars of the upper grate are raised above the surface of the bars of the lower grate, and the draught is merely checked, but by imparting to the crank shaft a sliding motion, the bars of the upper grate can be made to cover or uncover the openings between the bars of the lower grate, and the draught can be regulated with the greatest nicety.

PAVEMENT.—D. HUESTIS, Cold Spring, N. Y.—This invention consists in the use of iron boxes with or without dovetailed composition or metal parts, and the interior filled with cement so that the composition face, together with the outer portions of the iron box, with intersecting grooves, constitutes the traveling surface. The composition or metal face is dovetailed into the interior of the box and combined with the cement so that the pressure arising from the weight imposed upon any part of the box will not cause an elevation or depression of any portion.

COMBINED EASY-CHAIR AND WRITING DESK.—WM. A. E. EHLMAN, Milwaukee City, Wis.—This invention consists in so attaching the back of a chair to its body, that when so desired, it can be swung over and into a horizontal position or nearly so, with its rear side uppermost, and there supported, with the seat portion of the chair free, so that the chair then can be used as a writing desk or table.

SPINNING MACHINES.—THOMAS G. ODELL AND BOYD GLOVER, Camp Point, Ill.—The object of this invention is to produce a spinning machine for domestic use which can be used in an upright position standing on a common table, or in a horizontal position clamped to the edge of a table.

TWEER IRON.—JAMES F. MAGUIRE, East Boston, Mass.—This invention has for its object to furnish an improved tweer iron for blacksmith's forges, and it consists principally in combining a water grate with an air chamber.

IMPLEMENT FOR SHARPENING KNIFE BLADES.—JOSEPH MC KNIGHT, Pomeroy, Ohio.—This invention consists in so securing two cutters for sharpening blades to a suitable handle, that they can be adjusted with regard to each other, according to the bevel desired to be given to the cutting edges of the knife blades.

HARNESS NAILS.—F. R. REYNOLDS, Newark, N. J.—The object of this invention is to furnish an improved, convenient and simple mode for forming soft metal plated heads upon harness nails.

SELF-LUBRICATING JOURNAL BOX.—Albert R. Sherman, Natick R. I.—This invention consists in the arrangement of caps, which catch over the ends of the journal box and revolve with the shaft, in combination with a brush or scraper, so that the oil which is forced out at the ends of the journal box and which collects in the caps, is returned to the journal, and the lubricating material is thus used over and over again until it is spent.

HORSE HOE.—DANIEL HARRIS, Canaan, Me.—The invention consists in the construction of two adjustable mold boards and a stave connected together and applied to a beam so as to form a very simple implement and one which will perform the work thoroughly.

BEATER PRESS.—J. A. MCGILLIVRAE, Dyer, Ind.—This invention consists in a novel construction of the press, whereby great strength with durability, simplicity and economy in construction are obtained, and a uniform adjustment of the levers and platen at the termination of the upward movement of the latter. The invention also consists in a novel construction and arrangement of the windlass and tripping apparatus.

SALVE.—GEORGE BACKETT, New York City.—This invention relates to a salve especially intended for use upon boils, sores, and other eruptions of the skin or flesh; cuts, wounds, and other bruises, abscesses, etc.

GUIDE.—J. T. CAPEWELL, Woodbury, Litchfield county, Conn.—This invention relates to a guide for folding the edges of straps over and upon each other, especially intended for the manufacture of harness reins, and is to be used in connection with a sewing machine.

VALVE LOCK.—C. C. TORRENCE, Ripley county, O.—The object of this invention is to provide a lock to secure any kind of slide throttle valve and prevent its being opened unless by one having a key.

TRELLIS OR RACK FOR VINES.—B. F. ELLIOTT, Cedar Rapids, Iowa.—The object of this invention is to so construct a trellis for vines, that in autumn or the fall it can be raised or lowered without removing or detaching the grape or other vine from it.

PORTABLE EVAPORATOR.—S. B. MAULSBY, Indianapolis, Ind.—This invention relates principally to combining skimming chambers and a finishing pan with the revolving pan, and to the construction of the skimmer to be used therewith.

STOVE.—THOMAS WHITE, Quincy, Ill.—This invention relates to stoves for heating purposes, and is intended to secure economy in the use of fuel, together with such a protracted or long-continued circulation of the gases and hot air from the fire chamber before they escape from the stove as to cause them to part with the greater part of their caloric while yet in the stove.

GANG PLOW.—WILLIAM T. ROGERS, Quincy, Ill.—This inventio consists in so arranging a gang of plows on a carriage, that they may be easily unshipped, and cultivator teeth substituted for them. It further consists in an arrangement of devices applied to the driver's seat, rendering it adjustable to suit the inclination of the seat bars.

CHURN.—JOHN YOUNG, Adrian, Mich.—The cream is forced through apertures in the dasher, and made to circulate in grooves which are concentric with the dasher shaft, one of the grooves being in the upper and the other in the under surface of the dash- the effect of which is to produce unusual agitation and friction.

CULTIVATOR.—JOHN N. AEVIN, Valparaiso, Ind.—This is a novel manner of arranging the inside shovels of the plow, which may be adjusted laterally by the action of the feet of the driver so as to conform to the sinuosities of the rows of plants, and all of which are capable of being raised out of the ground when required.

PLOW.—HUBBARD MARTIN, Taylorsville, Ky.—This invention relates to that class of plows in which metal is wholly used in the construction. The object is to obtain a plow with a beam and handles constructed of wrought iron, and in such a manner as to insure strength with lightness and durability.

SCREW PLATE.—NICHOLAS ZILLIER, New Castle, Del.—This is an improved screw plate for cutting the threads upon screws, simple in construction, and easily adjusted, so as to cut the threads upon screws of any desired size without changing the dies.

KNIFE AND SCISSORS SHARPENER COMBINED.—JAMES J. RUSS Worcester, Mass.-This invention consists in the combination, with a novel constructed stand, of a sharpener plate, which is so secured to one of its sides as to be adjustable thereon. Against the edges of this plate the knife or scissors blades are sharpened.

WIND WHEEL.—C. NICKERSON, —— county, Ill.—This invention consists in forming the wheel with two sets of vertical wings, leaving their upper and lower ends secured in circular heads, which are keyed on a vertical shaft, one set of wings projecting further out from the wheel shaft than the other, and the outer and inner wings being placed alternately in the wheel, whereby the wind acts first against the outer and then against the inner ones, and escapes through the wheel, so that the wheel requires no change in position to suit the direction in which the wind may be blowing.

MANUFACTURE OF WRENCHES.—HENRY W. PELL, Rome —This invention consists in subjecting a straight bar of iron of the requisite length, width, and thickness, to the action of a series of dies by which a head similar in shape to the ordinary heads of wrenches is formed thereon, with the full strength of the iron retained.

DRIVING WELL TUBES.—CALVIN SHEPARD, Kattelville, N. Y. —The object of this invention is to provide more efficient and speedy means for driving or sinking well tubes than have been known or used hitherto.

LADY'S GARTER HOLDER.—E. T. BURROWS, Mystic River, Conn. —This invention consists in a soft, flexible band, which is to be clasped around a lady's leg, next the skin, over which the stocking is to be drawn, and the usual elastic garter placed so as to encircle the stocking directly over the band, and thus all uneasiness occasioned by the elastic binding the leg too tightly is obviated; beside this, the stocking is held up more securely and neatly.

FILLING MACHINE.—OSCAR PLACE, Brooklyn, N. Y.—This is a machine for filling uniformly packages of farina and similar substances that will not clog in flowing through small apertures.

CLOTHES WASHING RUBBER.—HIRAM BURK, Mineral Point, Ohio.—The object of this invention is to furnish an improved clothes washing rubber, to be attached to a wash or rubbing board, to take the place of the hands in washing clothes.

POTATO WASHER.—JOSHUA H. WILLIAMS, East Craftsbury, Orleans County, Vt.—This invention has for its object to furnish a machine by means of which potatoes may be quickly and thoroughly washed.

PUMP.—JOSEPH W. DOUGLAS, Middletown, Conn.—With this invention a double-acting pump with only one side pipe is produced. The piston rod is hollow and receives the liquid, which is forced upward through the piston, while the liquid which enters the pump cylinder through the side pipe is received in the top of the piston, and forced thence through the piston rod to the top of the pump.

SULKY PLOW.—PETER YOUNG, El Paso, Ill.—This invention relates to the mode of operating sulky plows, whereby the movements of the plow are managed and controlled with the greatest facility.

ROTARY BLOWER.—P. H. & F. M. ROOTS, Connersville, Ind.—This invention consists in the peculiar construction of the revolving abutments of a rotary blower, each of the abutments being composed of two pistons which form arcs of circles in combination with intervening recesses, which also form arcs of circles, so that four essential points are formed at which the abutments come in contact during their revolution, and that by rendering the contact at these points air-tight, the revolving abutments are enabled to produce the desired effect; it consists also in constructing each of the revolving abutments of two or more metallic crossheads fastened on a suitable shaft, and made square, polygonal, etc., in combination with wooden staves, which are bolted to the crossheads, and then dressed to the proper shape.

MARINE CAR.—GEORGE H. YOUNG, Charlestown, Mass.—This invention consists in the application, for the purposes of marine locomotion, of a system of articulated pontoons in the form of one or more endless belts, in combination with a suitable vessel, in such a manner that the pontoons serve the double purpose of buoys and also of buckets or propellers, and thereby the resistance of the vessel moving in the water is greatly reduced.

HORSE RAKE.—JOHN N. BAXTER, Greensburg, Ind.—The object of the invention is to obtain a revolving horse rake which will operate with but little friction, be simple in construction, and economical to manufacture.

NEW PUBLICATIONS.

NEW MUSIC.—Oliver Ditson & Co., of Boston, the well-known publishers of Music, have just issued the following new pieces for the piano:—Il Balen, Trovatore, Soldiers' Chorus, Kathleen Aroon, Nocturne, Crispino e Comare. Gems from the German. Bring forth the Bride. Harmonics. Dance Music, etc.

Notes and Queries

J. B. H., of N. Y.—The term "cupola" is applied to those furnaces used for the second fusion of iron, so named from the dome which formerly was placed at their tops to lead the smoke to the chimney. The common blast furnace for reducing the ores is much more entitled, from its form, to the distinctive term "cupola" than the common foundery furnace. But that which is used in ordinary iron casting is commonly called a cupola furnace.

E. A. W., of Philadelphia.—The offensive smell of lard oil may be removed by straining it, and agitating it at the same time with water containing about one per cent caustic soda.

L. P. L., of N. Y.—You are correct in your supposition that the heat of the blood does not materially vary in summer or winter.

R. M. Du B., of N. J.—Use good hydraulic cement. It is the only cheap substance that will make a wall, exposed to water, safe and sound.

V. McG., of——.—Your coloring extracts ferment in this hot weather; keep them in a refrigerator or prepare them oftener and they will not smell badly.

N. J. Co., of N. H.—Hardened steel can be etched by any acid which bites iron. A mixture of nitric and sulphuric acid, equal parts, bulk for bulk, with an equivalent, in bulk, of water will be found to be what you want.

E. H. H., of Ohio.—Copper bears a proportion of tensile strain to boiler iron of 17 to 31, or about one-half. It does require "heavier material," or rather, thicker material, for larger surfaces than for small, to resist pressure. "Bourne's Catechism" will give you the proportions.

M. E., of N. Y.—We do not think glass would answer your purpose as a step to your turbine. The shaft is probably cast iron, and great friction would be created between cast iron and glass, working in water. Rock maple, lignum-vitæ, or hickory prepared by boiling in oil and used with the grain parallel with the shaft, or vertical, would make as good a step as you can obtain. Try it.

S. F. W., of Iowa, finds a difficulty in getting a molder to draw the patterns for sheet metal swages without disturbing the sand and injuring the molds, and asks if some better material than sand cannot be used which will withstand the heat of melted iron and preserve a rigid mold. He suggests plaster of Paris. A good molder can draw a properly made pattern right. The molds may be made more delicate and perfect by a mixture of loam with your sand. Plaster of Paris will not stand molten iron. It crumbles and loses shape Try loam with your sand, making sure of having vents for your gases, then dry your mold by a fire of shavings, and if your patterns are properly made and your molders conscientious and capable, you will have no trouble.

P. C. S., of R. I.—The force of expansion of any body is evidently equal to the force required to effect a compression to the same amount. In the larger treatises on physics you will find tables of compressibility, 1 atmosphere of pressure condenses mercury .0000263. Another way of determining the expansive force of mercury is based on the dynamic theory of heat; the expansive force due to a unit of heat is 772 foot lbs. The expansive force of mercury appears to be about twice that of water, and greater than that of any other liquid yet tested; of course it is practically irresistible.

W. B. S., of Mich.—There is no difficulty in keeping the gases separate when decomposing water by the battery and thus we are sorry to find that your ingenuity has been misdirected. The real trouble in the case is the cost of materials consumed. To decompose a pound of water by the battery requires at least 32 lbs. of zinc and about 60 lbs. of acid.

R. O., of N. Y.—You are correct in supposing there is more heat in a cubic foot of water than in a cubic foot of air, both being of the same temperature. If you represent the heat in 1 lb. of water by 1, the quantity in 1 lb. of air would be .237. But as water is about 800 times heavier than air, it follows that the heat in the cubic foot of water must be over 3,000 times that in the cubic foot of air.

C. L., of Pa., wants information on the use of belts for polishing wood.

J. H. A., of Pa.—We have not received the minerals in question.

E. F. S., of Pa., supposes two cylinders of the same diameter and length; one of the cylinders is solid and the other is hollow and contains a smaller cylinder which can easily roll in it; the solid cylinder is of the same weight as the other two. Query: If the solid cylinder and the hollow one with its contents be placed upon a level plane which would require the greater force to roll it? We answer: the force required in both cases would be the same for the reason that there is the same weight of matter to be moved and the same friction surface. Over an uneven road it would probably be more troublesome to roll the hollow cylinder, it would go along by jerks like a barrel half filled with water.

J. F. L., of Ohio.—In evaporating sirup it is advantageous to have the sirup as shallow as possible, and in motion; in such circumstances the sirup boils at a lower temperature, and there is an economy of fuel. We understand that metals, as well as all other substances, when they are solid invariably contract with cold. The point of maximum density of water is about 37 deg.; from this point to solidifying it expands by cold, but as soon as it has become solid it contracts by cold.

Van K. & Co., of Ill.—It seems rather strange that men should keep on inventing water wheels to pump their own water, which is the case in the drawing you send us. A ram is to throw water up on to a wheel, and the wheel is to pump water into a tank for the ram. This is a mechanical illustration of what politicians call the balance of power.

L., of N. Y.—It is not unusual for boiler plates to crack along the line of rivets. It is often caused by using a drift pin to bring the sheets fair, and is as likely to be the inner as the outer plate. If the driving belt slips on a large pulley it must be owing to some local peculiarity which can be found by search.

SPECIAL NOTICES.

Oldin Nichols, of West Roxbury, Mass., has petitioned for the extension of a patent granted to him Oct. 12th, 1853, to which additional improvements were annexed March 30th, 1854, for an improvement in Grinding Mills. The petition will be heard on Monday the 24th day of September next.

Peter Geiser, of Greencastle, Pa., has petitioned for the extension of a patent granted to him on the 19th day of October, 1852, for an improvement in Grain Separators. The petition will be heard on Monday, the 1st day of October, 1866.

D. D. Allen, of Adams, Mass., has petitioned for the extension of a patent granted to him on the 19th day of October, 1852, for an improvement in Tool for Cutting Pegs out of Boot soles. The petition will be heard on Monday, the first day of October next.

Alber Gardner, for himself, and as Administrator of William L. Hunter, of Cincinnati, Ohio, has petitioned for the extension of a patent granted to the said Gardner, as said Administrator, and to himself, October 26, 1852, for an improvement in Plows. The petition will be heard on Monday, the 8th day of October next.

PATENT OFFICE.

PATENTS GRANTED FOR SEVENTEEN YEARS.

MUNN & COMPANY,

In connection with the publication of the SCIENTIFIC AMERICAN have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *twenty years*. Statistics show that nearly ONE-HALF of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after so many years' experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office.

Judge Mason, formerly Commissioner of Patents, says, in a letter addressed to us:—"In all your intercourse with the Office, I always observed a marked degree of promptness, *skill*, and fidelity to the interests of your clients."

Ex-Commissioner Holt says:—"Your business was *very large*, and you sustained and justly deserved the reputation of *marked ability* and *uncompromising fidelity* to the interests of your clients."

Ex-Commissioner Bishop says:—"I have ever found you faithful and devoted to the interests of your clients, as well as *eminently qualified* to perform the duties of Patent Attorneys."

EXAMINATIONS.—If an Inventor wishes our opinion in regard to the probable novelty of his invention, he has only to send us a pencil or pen-and-ink sketch of it, together with a description of its operation. For an Opinion, without examination at the Patent Office, we make no charge, but if a

PRELIMINARY EXAMINATION AT THE PATENT OFFICE is desired, we charge the small fee of $5. This examination involves a personal search at the Patent Office of all models belonging to the class, and will generally determine the question of novelty in advance of an application for a patent. Up to this time we have conducted over TWELVE THOUSAND Preliminary Examinations, thus showing a more intimate knowledge of inventions at the Patent Office than can be possessed by any other person or firm.

If an inventor decides to apply for a patent, he should proceed at once to send us, by express (charges prepaid) a model not over one foot in size, and substantially made. He should also attach his name and residence to the model.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Canadians have to pay $500.

FOREIGN PATENTS.—Messrs. MUNN & CO. have had more experience than any other solicitors in this country in procuring foreign patents, and have old-established agencies in London, Paris Brussels, Berlin, Vienna, and other large cities. Foreign business should never be intrusted to other than experienced agents.

If an inventor wishes to apply for a patent, all he has to do is to write to us freely for advice and instruction, and he will receive prompt attention. If his invention contains any patentable features, he can depend upon getting his Letters Patent. All communications considered confidential. Send models and fees addressed to

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PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as a fee for copying. We can also furnish a sketch of any patented machine to accompany the claim, at a reasonable additional cost. Address MUNN & CO., Patent Solicitors, No. Park Row, New York.

Improved Breech-loading Cannon.

This method of loading cannon at the breech consists in having a movable arm, A, jointed to the cannon so that it swings freely on its axis. In this arm are the chambers, B, which contain the charge. Figs. 1 and 2 show the arrangement. The vents are in the side of the chambers where they can be easily manipulated at each discharge, and are also convenient for firing.

As each shot is fired, or as one chamber is brought into line with the bore, the other is thrown back far enough to allow it to be loaded, so that a continuous discharge can be kept up so long as the temperature of the gun permits. The dotted lines in Fig. 2 show the position of the vibrating arm when moved so as to bring one chamber in line with the barrel of the gun.

One half the right may be bought on reasonable terms by addressing the inventor, John A. Miller, of Paducah, Ky., by whom it was patented Feb. 7, 1865.

Fig. 1

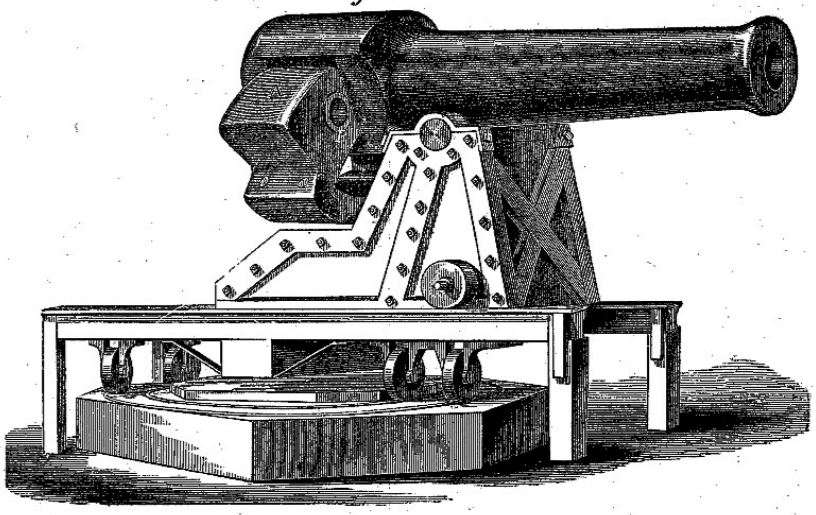
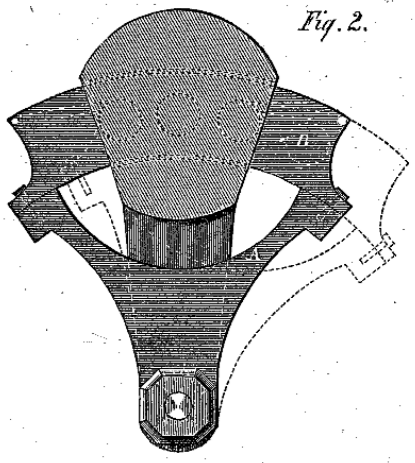


Fig. 2.



MILLER'S BREECH-LOADING CANNON.

New Oxide of Magnesium Light.

It is well known that the oxide of magnesium is practically infusible, and that it has the property of being volatilized, but in the smallest quantity, in a flame of oxygen and hydrogen mixed together, and without imparting any color to that flame. The oxide has also the property of spreading, on being placed within the flame, an intense, bright, and constant light, and which is admirably suitable to photography. Many magnesium salts, and particularly chloride of magnesium and carbonate of magnesia, have the property of leaving some oxide of spongy magnesium on being decomposed by the oxyhydrogen flame. Availing himself of a knowledge of these principles, Prof. Prospero Carlevaris, of Genoa, proposes to employ the process now to be described. A piece of chloride of magnesium, larger or smaller, according to the effects of light required, is placed upon a small prism of gas-retort coal, and upon it, through a small tube purposely made, the flame of the oxyhydrogen gas (the mixture of oxygen and hydrogen) is directed; or a prism, or even a small and well-compressed cylinder of carbonate of magnesia is placed within the flame from the same mixed gases. The chloride of magnesium or the carbonate of magnesia is directly decomposed and resolved into oxide of spongy magnesium, from which the intense, bright, fixed and constant light comes forth, causing all the chemical phenomena of diffused sun light. The gases of the said combination, which are pure hydrogen, or even ordinary illuminating gas, and pure oxygen, or even atmospherical air, flow separately from two different gasometers, and are mixed only in a very small tube at the end of the pipes. They can be prepared in the ordinary way when wanted in small quantities; if wanted on a large scale, pure hydrogen is prepared by causing steam to pass over incandescent charcoal. Oxygen is prepared with manganese, and hypochlorate of lime with manganese and silicic acid, or with dry sulphate of iron, the product of whose decomposition is caused to pass upon platinated pumice stone, turning to profit the sulphurous acid resulting from the process to the preparation of sulphites. The invention, is, therefore, essentially the production of light, by placing the oxide of spongy magnesium in a flame produced by a mixture of oxygen and hydrogen.—*London Mining Journal.*

APPLEBY AND GOULD'S LAMP CHIMNEY.

"If it were not for the chimney," said a friend to us recently, "the kerosene lamp would be perfect.

Fig. 1

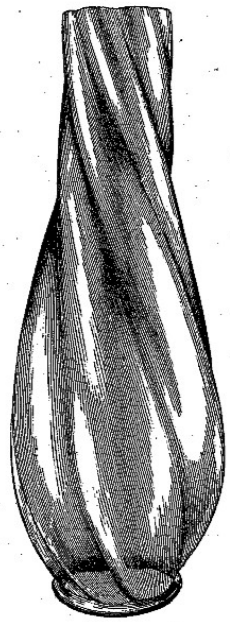
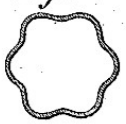


Fig. 2



It gives a whiter light than gas, it is more steady, it is far cheaper, and there are no insolent collectors about it sticking red bills in your face every month."

The advantages mentioned are certainly obtained, and if we are ever to have a chimney that will not crack from unequal expansion, we shall owe it to the perseverance of inventors.

The latest invention in this line is illustrated herewith. It is a glass chimney with spiral grooves extending from top to bottom, the object being to equalize the expansion of the glass when heated, and prevent it from breaking.

The engraving shows the invention very clearly. The small figure underneath the principal indicates the amount of corrugation. Patented by H. C. Appleby through the Scientific American Patent Agency June 12, 1866. Address Appleby & Gould, Conneaut, Ohio.

Report on the Springfield Rifle.

The Springfield *Republican* says the military board, appointed for an examination of the various fire-arms now in use by different nations, have carefully examined sixty-one different rifles and muskets and have reported that the most effective, safe, and substantial arm, is the Springfield rifle with the Berdan improvement, which changes it to a breech-loading rifle. The board consisted of Major-Gens. Hancock, Buchanan and Griffin, Brig.-Gen. Haynes, and Cols. Owens, Benton and Porter, and it is unofficially stated that the members were unanimous in their recommendation of the Springfield rifle. It is not alone in this country that the Springfield rifle is now in favor. Louis Napoleon, while casting about for the most effective arm for his army, came to the same conclusion with our own board of examination; an agent of the French Government lately bought of a Philadelphia machinist a full set of the machinery needed for the manufacture of the Springfield rifle for 100,000 francs in gold, and shipped it to France. This was before the report of our examiners recommending the addition of the Berdan improvement had been made, and one of the rifles with that improvement is now being made, and will be sent to France at once as a pattern. When the French Emperor fights he wants to fight successfully, and he seems to have full confidence in the value of our fire-arms and in the ingenuity of American mechanics.

The "Lord Warden's" Engines.

The London *Engineer* publishes a supplement to its issue of the 29th June, wherein working drawings, in plan section and elevation of the *Lord Warden's* engines, are given; the scale is one-fourth of an inch to the foot.

The engines have three cylinders each 90 inches diameter, 48 inches stroke, and are of the back-acting variety. There are many novelties in detail, but the most striking one appears to be the use of gearing to drive the main valves instead of eccentrics. There are four large gear wheels, each about 42 inches in diameter, between the main valves and the shaft, and these, through the intervention of a crank shaft, perform the work. It seems rather a perilous reliance to put faith in the teeth of gears to do such work, but we console ourselves with the reflection that the builders, Messrs. Maudslay & Field, probably know what they are about.

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NEW YORK, SATURDAY, AUGUST 4, 1866.

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INVENTORS—THEIR LABORS AND REWARDS.

"The inexorable logic of facts" is rapidly correcting some popular errors in regard to the work and compensation of inventors. The idea that inventors are a sort of dreaming philosophers, isolated from the masses, and existing only in the laboratory and library, is a mistaken one; and not less erroneous is the notion that they are a class who sow that others may reap.

The time was, in the twilight of science and the dawn of the arts, when the inventor or discoverer environed his studies and his person with mystery, and derived a distinction from the secret which he professed to hold. To make it public would bring him no advantage, but take from him the homage of the ignorant. No paternal and enterprising government extended over him its protection of a patent law. The world was not ready for him. Chemistry was but a series of experiments to discover the art of the transmutation of metals or the elixir of life. Men, enriched with the lore of the ages and developed by constant study, were content to conduct their experiments with a view of ascertaining how to change the baser metals to gold, or to rival the antediluvians in length of life. Undoubtedly, although success did not wait on their efforts, those very efforts carried their own reward with them. But their studies and half-perfected discoveries remained like finger-posts to direct the investigations of those who came after them. The modern school of scientists owe much to the recorded observations of those who saw, in the means they used, an approach to the end they sought, but never reached.

If investigation and study ever descended from its stilts in the laboratory to the walks of common life, it was only to construct a toy wherewith to amuse the leisure of the inventor and to astonish the unlearned. The philosophers of the early ages were so jealous of their fancied distinction, that many o them died without leaving to posterity their richest legacies—the result of the experiments whose means they recorded. Or, if they left a record it was like the divinations of the Delphic priestess—ambiguous and couched in the form of a lingual puzzle. But despite these drawbacks, these men left us much to be thankful for. The shadows of the great minds who walked in the slant rays of the rising sun of civilization, are projected across the plane upon which our inventors travel.

From the chosen paths of these impractical thinkers such men as Watt and Arkwright diverged, and sought the broad road of utility. In their hands the scientific toys of the old philosophers became useful agents for the improvement and elevation of the race. Here, then, was and is the true secret of the inventor's success. His aim should be something higher than a design to construct a wonder-waking machine, or to show his independence of thought by altering or diverging from the works of others without completing a real improvement. Utility should be his guide and his aim. And it is not enough that he conjectures or speculates on what may be done, or that he even convinces himself by investigation and private experiment that his improvement is feasible. The true inventor must demonstrate the value of his improvement by actual experiment, on a scale sufficiently large to prove its value in practical use, before he is legally entitled to the distinction of the term inventor. It cannot be doubted that many valuable improvements now in general use, and yielding handsome annual incomes, would have borne another name and poured their profits into other pockets, if the first discoverer, in point of time, had possessed the necessary faith in his improvem nt, or the requisite energy and enterprise to have wrought out his discovery to a successful experiment. One may sit and dream from day to day and year to year over a conjectural improvement, but it will avail him nothing, however meritorious, unless he builds for it something experimentally stronger, as a foundation, than the "baseless fabric of a vision" rests upon. While he dreams another is waking and working, and the impractical visionary is compelled to see the laurels he thought himself entitled to worn by another.

The work of the inventor, then, is not only to devise and calculate, but to prove and demonstrate. He must be a man of energy as well as of thought—he must be enterprising as well as original. If he is independent enough to strike out a new path, he must not be content merely to survey it, but he must lay out the road, grade the surface, and propel himself and his improvement over it before he can claim toll of the world.

Here, then, is the reward of the inventor. He is no longer a visionary, suggesting in sphynx-like utterances the way to improvements, standing at the parting of the ways and pointing, but never traveling the road; but he is a moving, animated man, a man of business, a man of labor, clearing the obstructions from his path and leading the way. Pity for the fate of unfortunate inventors who never reap the seed they have planted, he does not need. His energies bear him through the season of anxious sowing and watering to the time of the abundant harvest. The time is past when inventors were the prey of the wealthy and unscrupulous. Judicious patent laws offer to all whatever protection the value of their discoveries entitles them to. The demand for improvements in the arts is such, that there is not in the market a more salable commodity than a valuable and practical invention. If the inventor has neither the capital nor inclination to engage in the manufacture of his improvement, he has his patent which represents capital and can command it.

No men in the community can more readily dispose of their wares at remunerative figures than the inventors of real improvements. A case came under our observation but a short time ago, when a young man from one of our Western States, in looking for a party to manufacture an invention he had just patented, sold the right to make and sell in the South and West for over one hundred thousand dollars.

Let inventors but confine their researches and experiments to the really useful, test their value until it can be demonstrated, and there will be no difficulty in securing the reward of their labors.

THE FORCE OF WIND.

The thunder storm which followed the piteously hot weather of a fortnight since was preceded, in many sections of the country, by a high wind which blew down houses, uprooted trees, prostrated crops, and sent cattle in the pastures galloping before it as though possessed of devils.

It seems strange to see such terrible effects from an element that scarcely an hour before breathed softly through vines and trifled with the quivering leaves of the maple, and we realize forcibly the power of this element from the results.

Winds are caused by changes of temperature; when the air is heated or rarefied, it rises, and from some other part of the country cooler air rushes through to supply the partial void, and thus the air is put in motion.

The force of wind is determined by an anemometer. These instruments have been made of various designs—some recording the force, and others requiring observation to determine it. The simplest form is that of a disk having a horizontal shaft fitted with a spiral spring working between two standards; these latter also support the shaft. It is easy to graduate the rod so that any number of pounds' pressure put upon the disk will be indicated by it.

Woltman's anemometer consists of a revolving fan which has an index and a train of gearing attached, so that the force of the wind is weighed by the number of revolutions per minute. It is graduated by choosing some still day and mounting it on a railway train moving at a known velocity, which is, of course, the same as if the air moved at the same rate; tables are then formed from such data.

A wind that moves but one mile an hour is hardly perceptible, and has, according to Smeaton, a perpendicular force on one square foot of ·005 of a pound. A gentle wind moves at the rate of four miles an hour, and presses on one square foot ·079 of a pound. A pleasant gale moves from ten to fifteen miles an hour, and has a perpendicular force of from ·492 of a pound to 1·007 pounds. A high wind moves with a velocity of thirty and thirty-five miles per hour, and has a perpendicular force of from 4 to 6 pounds avoirdupois on one square foot. A hurricane travels at the rate of eighty miles an hour and has a force of 31·490 pounds per square foot.

It is not difficult to comprehend from this table how mighty oaks that have stood for years are leveled in an instant, and paths made through the forest where the stubborn undergrowth defied the power of man. Nor yet to understand how railway trains are thrown from the track, or ships tossed on the sea like cockle shells thrown on the strand by the falling tide. Man's power is great, but there is a mightier than he, and the winds and the waves obey Him.

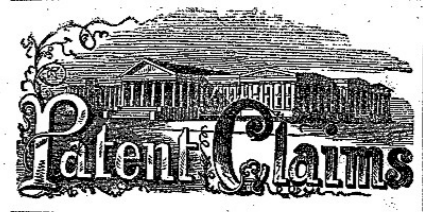
DISINFECTING BY STEAM.

The use of steam at a high temperature as a disinfectant was tested on Thursday, July 12th, at the house of Metropolitan Engine Co. No. 1, in Center street, this city, under the superintendence of Dr. Bell, the introducer of the process. Steam was raised on one of the fire engines, and discharged into an iron chest three or four feet square, containing a coil of iron pipe. A small quantity of carbolic acid was placed in the super-heater. Under this vessel a fire was built to give the requisite degree of heat to the steam. It was found, after a trial of fifteen minutes, that, by a self-registering thermometer, the temperature of the room to be disinfected was raised to 150 deg., and oysters and eggs were thoroughly cooked.

That a sufficient degree of heat can be evolved by this process to destroy the germs of disease which may exist in the atmosphere, seems to be probable, but the one objection is in regard to its want of facility of application. In hospitals and similar institutions this objection would not have the force it would applied to private dwellings. It is probable that the usefulness of this process will be greatly limited by circumstances. Its use cannot become so general as its claimed advantages would seem to warrant.

DESTRUCTION OF A BRIDGE.—A tornado, accompanied with hail, on the evening of the 25th ult., utterly destroyed the magnificent bridge of the Philadelphia, Wilmington, and Baltimore Railroad, over the Susquehanna River, at Havre de Grace. The bridge has been in course of construction for several years and was almost completed. The company have begun rebuilding it, and it is believed it will be completed for travel by the first of January next.

A TRAIN recently ran forty-three miles on the Hudson River Railroad on 4,300 pounds of peat.



ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING JULY 24, 1866.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

56,509.—MACHINE FOR PULLING UP OLD COTTON AND CORN STALKS.—William Altick, Dayton, Ohio.

I claim, first, The combination of the two rollers, M M, when one is made rigid and the other flexible or yielding in its bearings, substantially as and for the purpose specified.

Second, The arch or bow, D, when used with the frame pieces or bars, A A, and the rollers, M M, as and for the purpose herein specified.

Third, The arrangement of the shield, V, with the arch, D, and rollers, M M, substantially as and for the purpose set forth.

Fourth, The plate, S, constructed as set forth and arranged under the rollers, as and for the purpose described.

56,510.—CARRIAGE JACK.—Maurice Andriot, Mount Washington, Ohio.

I claim the arrangement of the standard, A C, fulcrum pin, D, lever, E F, self-locking chock, G, and trigger, K.

56,511.—CULTIVATOR.—John N. Arvin, Valparaiso, Ind.

I claim the arrangement of the joints, b, universal joints, H, link, O, arms, F, and chains, J, in combination with the curved plow beams, G M, and shaft, E, operating in the manner and for the purpose herein specified.

56,512.—HOOP SKIRT.—James E. Atwood, New York.

I claim constructing a hoop skirt of horizontal hoops, and the pendants, B B B, combined and arranged substantially as described and set forth.

56,513.—SALVE.—George Backett, New York.

I claim the salve made of the several ingredients, and mixed together in or about the proportions stated for the purposes specified.

56,514.—STOVE PIPE DRUM OR HEAT RADIATOR.—F. A. Balch, Hingham, Wis.

I claim, first, The pure air chambers, G G', connected with each other by the pipes, H H, which pass through the smoke pipe, C C, substantially as shown.

Second, The pure hot air chamber, G', provided with the register holes, J J, the valved flue, K, and the valve, L, substantially as described.

Third, A radiator with the pure air chambers, G and G', the smoke chambers, F and F', the smoke pipes, C C', and the pure air pipes, H H, constructed and arranged substantially as described and shown.

56,515.—SASH SUPPORTERS.—Silas D. Baldwin, Chicago, Ill.

I claim the combination of the elastic ball, a, spring, b, and retracting rod, c, with the case, C, provided with the inclined planes, arranged and operating substantially as set forth and specified.

56,516.—BOTTLE STOPPER.—Arthur Barbarin, New Orleans, La.

I claim the combination with stoppers for bottles, jars, and other receptacles, of the elastic fastening device, the whole being constructed and arranged for operation, substantially as herein described.

56,517.—HORSE RAKE.—John N. Baxter, Greensburgh, Ind.

I claim a frame provided with two sets of rake teeth, D D, projecting from opposite sides, in combination with thills, E, attached to the end pieces, C C, of the frame by pins or journals, d, secured to the inner ends of the thills and passing through oblong slots, c, in the end pieces, substantially as and for the purpose set forth.

56,518.—DUMPING CAR. — James Braidwood, Wilmington, Ill.

I claim the frame, c, constructed substantially as herein recited, in connection with a rail track, and for the dumping of the cars, all constructed and operated as described.

56,519.—CLAMP FOR HOLDING SAWS.—Jesse Briggs, Stuyvesant, N. Y.

I claim the construction and arrangement of the frames, A A', jaws, B B, hook projections, c', pins, c, cam, C, and lever, D, in the manner herein described and represented.

56,520. — CHURN. — George N. Brigham, Montpelier, Vt.

I claim the double or forked beaters, they having ribs or raised beads on both edges, as herein described, the same being so constructed as to operate in combination with reverse angular breaks on both sides and ends of the receptacle for containing the cream, so as to produce currents and counter currents toward the center of the revolving shaft, for the purposes herein set forth.

I claim the construction and arrangement of the beaters, B B, with their bevel side openings, b b, and ribbed edges, a a, the breaks, c c, and breaks, d d, top breaks, e e, for the purpose of churning and working butter, substantially as and for the purposes herein specified.

56,521.—HARVESTER RAKE.—R. D. Brown, Covington, Ind.

I claim, first, The arrangement of the forked pin, Q, rotating at the end of the slot, R, as herein described and for the purposes set forth.

Second, I also claim the arrangement and combination of the ratchet, P, and pulley, N, with the reel, M, for the purpose of tightening the belt, as herein described.

56,522.—REAPING MACHINE.—Robt. Bryson, Schenectady, N. Y.

First, I claim the arrangement of the gimbal or universal joint, d, with the two parts, c c', of an extensible shaft, when one part of the said shaft drives an endless belt, which operates a reciprocating rake arranged to move through a slatted platform, and the other part is attached to the draft frame and transmits the motion of the driving wheels to the gearing which drives the rake, in combination with a hinged joint harvester, all in such manner that one part of the extensible shaft maintains an unchanging position with respect to the grain platform, and the other part thereof maintains an unchanging position with respect to the draft frame, as set forth.

Second, The construction and arrangement of the parts, c c' d, for the purpose of forming an extensible joint shaft for a hinged joint harvester with a rake attachment, substantially as herein described.

Third, The construction, arrangement and combination of the rake head carrier, G, rails, g' g' and g2, rake head, i, spring slide, h2, spring catches, j j', pin, g, and endless belt, f f, substantially as and for the purpose set forth.

Fourth, The combination of the slot, e3, adjustable pin, e2, endless rake moving belt, f f, and reciprocating rake, h h', substantially as and for the purpose described.

Fifth, The combination of the rake head carrier, G, rake, h h' i, spring catches, j j, spring slide, h2, and endless belt, substantially as and for the purpose set forth.

Sixth, The rectilinear moving rake spur gears, d d', and section, c', of an extensible shaft, arranged on a hinged joint platform, as described, in combination with the gimbal or universal joint, d, section, c, of extensible shaft, bevel gears, and draft frame, all arranged and operating in the manner herein described.

56,523.—CLOTHES WASHING RUBBER. — Hiram Burk, Mineral Point, Ohio.

I claim an improved clothes washing rubber, formed by combining with a rubber board, A, having rubber flanges, a', of a plate, D, or its equivalent, a handle, c, the hinged and pivoted arms, F and G, substantially as described and for the purpose set forth.

56,524.—GARTER.—Edmund F. Burrows, Mystic River, Conn.

I claim a device for holding ladies' garters in their places upon the stockings, consisting of a flexible strip or band, a, covered with any suitable material or fabric, and provided with raised edges, c c, the said device to be clasped around a lady's leg, underneath the stocking, and the stocking held up by a common garter encircling the stocking directly over the band, substantially as shown and described.

56,525.—COOKING STOVE.—Esek Bussey, Troy, N. Y.

What I claim is, A three-flued cooking stove, having the central flue expanded so as to inclose on the sides and bottom the culinary boiler or hot water reservoir, B, the latter being so arranged as to rest upon or against the edges of the sides of said central flue, so as to constitute the interior side or wall of the same, substantially as set forth.

56,526.—VARNISH.—John M. Butcher, North Lewisburg, Ohio.

What I claim in this invention is the compounding of the several ingredients hereinafter named, in the proportions named, in the manner pointed out, and for securing the advantages enumerated.

56,527.—SEWING-MACHINE GUIDE.—J. T. Caperwell, Woodbury, Conn.

I claim a guide made conical or tapering from end to end, and provided with suitable ways or guides for the edges of the strap or material pass ng through it, so that when the strap issues from the smaller end of the said guide, its edges will be lapped or folded over each other, either more or less, substantially as herein described and for the purpose specified.

56,528.—APPARATUS FOR MAKING CHARCOAL.—K. S. Chaffee, Cambridge, Mass.

I claim the application of the condenser to the kiln by extending such condenser as a pipe around the kiln, and supporting it by means of series of branch pipes leading from it into the kiln, and combining with such condenser a discharge pipe, b, to extend from it, as set forth.

I claim the above-described arrangement of the condenser with respect to the kiln, viz., so as to encompass it and connect with it, substantially as described.

56,529.—FILLING FOR SAFES.—Robert A. Chesebrough, New York City.

I claim the use of bone black for filling in between the inner and outer walls of a safe or vault to render the same fire proof.

56,530.—VAPOR STOVE.—Samuel Child, Jr., Baltimore, Md.

First, I claim in apparatus for generating heat in vapor stoves as above described, regulating the supply of fluid to the retort or heating chamber, in the manner and by the means hereinbefore specified, that is to say, by locating the valve which regulates the flow of the oil or other fluid at or near the point where the fluid enters the said retort, substantially as and for the purposes herein set forth.

Second, I claim in combination with the retort or heating chamber of a vapor stove and valve seat located at or near the point of junction of said retort, with the pipe which connects it with the fluid reservoir, as specified, the valve constructed and arranged so as to operate on the axis of the said pipe, substantially as and for the purpose herein shown and described.

56,531.—EXPANDING FRAMES FOR SOLDERING FRUIT CANS.—John K. Cook, Richmond, Ind.

I claim the arrangement and combin tion herein described of an expanding frame for soldering fruit cans, capable of being withdrawn through the hole in the top of the can, when finished, as and for the purposes substantially as set forth and described.

56,532.—SPINNING JACK.—Gilbreth Dawson, Rockville, Conn.

First, I claim stopping the roping drums in spinning jacks from slipping round or continuing their rotation after the roping gear has been thrown out, by means of a brake acting automatically on a pulley placed on the drum shaft, substantially as described.

Second, I also claim the brake lever, H, in combination with the elbow lever, C, substantially as described.

Third, I also claim the combination of the brake, the lever, C, and the shaft, D, substantially as described.

Fourth, I also claim the combination of the brake, the lever, C, and the slide, J, constructed and operated substantially as described.

56,533.—MEDICAL COMPOUND.—P. M. Devos, New York City.

I claim a medical compound or composition when formed of such materials as will impart to it the characteristics herein described, and when used substantially in the manner and for the purposes specified.

I also claim a medical compound made by mixing camphor, nux moschata or nutmegs and capsicum, or red pepper, in combination with any suitable disinfectant, whether one or more in number, and when mixed together in or about the proportions named, and used substantially as and for the purpose specified.

56,534.—REAPING MACHINE.—Owen Dorsey, Newark, Ohio.

First, I claim combining rectilinear-reciprocating platform with a vibrating fender, in such manner that the grain, after it falls upon the fender, shall be deposited upon the platform, conveyed, and by the latter delivered upon the ground at one side of the machine, substantially as described.

Second, The combination of a rectilinear-reciprocating platform, which is composed of slatted bars, with a vibrating slatted fender, substantially as described.

Third, Automatically delivering the cut grain from one side of the machine by means of a platform which has a rectangular and vibrating movement, substantially as described.

56,535.—COMBINED BLACKING CASE AND NIGHT CHAIR.—J. H. Doughty, New York City.

First, I claim the box, B, containing the blacking case, the dressing case, and the night chair, in combination with the seat, A, constructed and operating substantially as and for the purposes described.

Second, The box holder, c', in combination with an ottoman, chair, stool, or other similar article arranged as a blacking case, substantially in the manner set forth.

Third, The sponge cup, e, in combination with an ottoman, chair, stool, or other similar article arranged as a blacking case, substantially in the manner described.

Fourth, The adjustable boot jack, J, or J', in combination with an ottoman, chair, st ol, or other similar article, arranged as a blacking case, substantially as and for the purpose set forth.

56,536.—SIGNAL TOWER.—Jason Dow, Biddeford, Me.

I claim a signal tower, constructed and operated in the manner substantially as shown and described, and for the purpose set forth.

56,537.—HITCHING STRAP.—John Dubree, Drumore Township, Pa.

I claim the simple strap, G, for the attachment of the hitching strap, F, when said strap, G, is connected with the bridle and bit, in the manner and for the purpose specified.

56,538.—WAGON JACK.—Albert Dunn, Plainfield, N. J.

I claim the combination of the bars or frames, A and B, or their equivalents, and handle lever, D, when constructed, arranged, and connected together, so as to operate substantially in the manner described, and for the purpose specified.

56,539.—HARDENING IRON.—William C. Dunn, La Porte, Ind.

I claim the process, herein described, of treating or hardening the cast-iron parts of plows, cultivator shares, and similar articles.

I also claim as a new article of manufacture, plow mold boards, land sides, or shares, when made of cast iron, treated in the manner herein described.

56,540.—COMBINED CHAIR AND DESK.—William A. Ehlman, Milwaukee, Wis.

I claim the combination of the chair seat, A, back, E, having eyes, K, side arms, D, having eyes, J, uprights or supports, c, and hook arms, H, or their equivalents, when all connected and arranged, so as to allow the back to be swung down into a horizontal position, or nearly so, and there supported, substantially as and for the purposes described.

56,541.—GRAPE TRELLIS.—B. F. Elliott, Cedar Rapids, Iowa.

I claim the side frame, C, and upper frames, D, in combination with the cross bars, E, or any other suitable fastening device for holding the said upper frame, D, in a horizontal position, or nearly so, when attached or connected together, and to any suitable bed frame or supports of the ground, substantially as and for the purpose described.

56,542.—INSULATOR FOR TELEGRAPHS.—A. B. Ely, Boston, Mass.

First, I claim a flanged disk on the insulating hook, when constructed and arranged in reference to the hole in the bracket, substantially in the manner and for the purpose set forth.

Second, The combination of the bracket and hole with the pin hook and disk, and arranged with or without flanges, substantially in the manner and for the purpose set forth.

56,543.—HAND LANTERN.—Charles Engelskirchen, Buffalo, N. Y.

I claim connecting the chimney cap, C, the glass or globe part, B, and the metallic base, A, together, by means of the skeleton frame, D E F, the said skeleton frame being so constructed and connected with the said parts, that the vertical wires, D, shall be permanently attached to the chimney cap, and the metallic base, A, shall be fastened to the glass or globe part by means of the spring band or clasp, F, and released therefrom, when the said spring band is unhooked, and the glass or globe part be retained within the skeleton frame, when the metallic base, A, is removed, substantially as described.

56,544.—KNITTING-MACHINE NEEDLE.—Levi W. Field, Holderness, N. H. Antedated July 13, 1866.

I claim the needle as made of the slotted shank, A, and the hooked lever, B, constructed, arranged, and applied together, substantially in manner and so as to operate as described.

56,545.—REAPING MACHINE.—Henry Fisher and Milton Ball, Canton, Ohio.

First, We claim the combination of the slotted arm, F', attached to the hinged wing board, C, for the purpose of adjusting the rod, D, vertically and horizontally, substantially as and for the purpose set forth.

Second, We claim in combination with an overhung rod and cutter bar, B, the hinged board, C, and rod, D, attached at the main frame end only to an oscillating arm, F, substantially in the manner and for the purpose set forth.

56,546.—INSTRUMENT FOR MEASURING TIRES FOR WHEELS.—Junius Foster, Long Branch, N. J.

I claim the guide, b, fitted as specified, in combination with the measuring wheel, b, for the purposes and as set forth.

56,547.—SCALE FOR WEIGHING ICE.—Talbot T Fowler, Washington, D. C.

I claim the links, I m and n, when connecting the bar, F, the scale beam, B, and weigh beam, E, arranged substantially as and for the purposes specified.

56,548.—PLANING MACHINE.—Joel Garfield, Groton Mass.

First, I claim the combination of the feed and guide rolls, e c, with the gears, d and d', constructed and operating substantially as specified for the purposes set forth.

Second, The combination of the frame, J K, with the slides m, m, the shafts L and F, constructed substantially as described for the purposes set forth.

Third, The combination of levers, o and N N, with springs, S S, and the shaft, Q, operating substantially as described for the purpose set forth.

56,549.—APPARATUS FOR TREATING ORES WITH CHLORINE.—Eugene Gaussoin, Baltimore, Md.

First, I claim the inclosing walls and floor, forming chambers in which the barrels revolve, and from which the fluid contents are removed by drains from the sides, and the solid by an aperture at corner of the arch.

Second, The combination of the hollow axle and perforated walls, forming a series of connections from the generator, from barrel to barrel, and ultimately the discharge apertures at the summit.

Third, The arrangement of the barrels with their operating gearing, so that their respective openings are in revolution presented alternately to the openings of the ones next in series above, and next below, so afford the means of discharging as described.

Fourth, The combination of the revolving barrels, and the openings, J, and wall openings, H, as and for the purpose described.

Fifth, The combination of the valve, K, with the drains, Y Y W, as and for the purpose described.

56,550.—FARM GATES.—Francis Gay, Bedford, Ohio.

I claim the standard, D, the pedestal, E, and the pin or stem, F, as arranged and in combination with the gate, A, in the manner and for the purpose herein set forth.

56,551.—BEE-HIVE.—Samuel Graffham, Lawrenceville, Ill.

First, I claim a bee-hive which combines in its construction the following elements, viz., a pit, N, and sloping shelves N', a case, A, separated from the pit by a grated bottom, M, and having a porch, A', closed by a sliding door, D, and a cover, E, with caps, F F', and a drawer, L, located above the porch, the several parts being constructed and the whole arranged for use substantially as set forth.

Second, I claim the wedge formed stopper, K, when used for closing the slats in the front of the case after the removal of the slide, I, substantially as set forth.

56,552.—REVERBERATING AND OTHER DRAUGHT FURNACES.—John R. Grout, Detroit, Mich.

First, I claim in a reverberating or other draught furnace so arranging the atmospheric passage ways, a a' a'', and b b' b'', in the bridge, wall, and arch of the furnace, that the air passing in their currents, shall be heated by contact with the walls, and introduced from above and below into the compartment, D, in converging currents of the full width of the throat, C, when mingling with the unconsumed carbonized gases from the fuel in the fire room, B, their complete combustion and perfect diffusion will be effected, substantially in the manner set forth.

Second, I claim the combination of the plate, f, valve, g, rod, h, and lever, i, in the lower air passage and the similar combination in the upper air passage or their equivalents for the regulation of the passage of air through the atmospheric passage ways, a and b, substantially as and for the purpose set forth.

Third, I claim constructing the bridge, C, across the lower atmospheric passage way for the protection of the valve, substantially as set forth.

56,553.—WATER ELEVATOR FOR WELLS.—Christopher Gullmann, Poughkeepsie, N. Y.

First, I claim the mouths, i', on the hollow shaft, i, arranged relatively to the bucket and to the rope, or its equivalent, and to the loose sleeve, G, connected by a clutch to the shaft, D, so as to perform the double function of retarding the descent of the bucket and ventilating the well, substantially in the manner herein specified.

Second, I claim the oscillating part, K, so mounted and arranged relatively to the bucket, and its connection liberated for descent, as described, that it shall retard the descent of the latter, in the manner herein specified.

Third, I claim the well bucket arranged to descend automatically, the revolving mouths, i', and the oscillating part, K, and the several connecting members of the mechauism, combined and arranged to effect the retardation of the descent of the bucket and the ventilation of the well, substantially as herein specified.

56,554.—CHAIR.—John Habermehl, Wheeling, West Va.

I claim the combination of the seat, metallic loops, and crosspiece of the rear legs constructed as described.

Second, Combination of loops, C, and rod, A, in a chair constructed to turn as described.

Third, Combination of spring, E, and rod, A, in a chair constructed as described.

56,555.—HORSE HOE.—Daniel Harris, Canaan, Me.

I claim the share, C, constructed or formed with sides, a a, inclined both transversely and longitudinally, and also formed with a central longitudinally inclined surface, b, having a horizontal position in its transverse section, in combination with the adjustable mold boards, E, pivoted to the rear of the share, C, and retained in position by the clamp, F, and bars, e e, all arranged substantially in the manner and for the purpose set forth.

56,556.—PUMP.—E. B. Harris, Wilmington, Ill.

I claim the arrangement of the well, A, cylinders, C C, valves, D D, vertical rods, F E, disks, F F, valves, G G, partitions, H H, valves, I I, and trough, J, operating in the manner and for the purpose herein specified.

56,557.—RATION FEED BOX.—James Hayden, Exeter, Wis.

First, I claim the ration box when constructed, arranged, and used in connection with the feed box, A, substantially as herein set forth and described.

Second, The gate or slide, E, when constructed and used substantially as and for the purpose set forth.

Third, The measure box, S, and slides, when constructed, arranged, and used in connection with the ration box and reservoir box, substantially in the manner and for the purpose described.

Fourth, The reservoir box, X, when used in connection with the measure box, substantially in the manner and for the purpose set forth.

Fifth, The rod and nut used in connection with the gate or slide, E, when the whole are constructed, arranged, and used substantially as and for the purposes set forth.

Sixth, The opening, N, connecting the feed box, A, with the ration box, B, when combined, arranged, and used in connection with the gate or slide, E, substantially as and for the purpose set forth. Said ration feed box may be made double for two or more horses or other animals, as shown, or single for one horse or other animal; the several parts of the single or double ration feed box, as a whole, being substantially the same.

56,558.—SAND BELLOWS.—John W. Hendley, Washington, D. C.

First, I claim the arranging of the sand box above the bellows so that it may be operated by the movement of the upper board or plate of the bellows, substantially as herein recited.

Second, I claim the connecting of the box to the pipes, and the nozzle to the sand and air pipes, by the elastic pipes, constructed and operated substantially as set forth.

Third, In combination with the nozzle and the conducting pipe, I claim the lever, J, constructed and arranged so that the parts may be operated as described.

56,559.—GUN SWAB.—P. M. Hendrick, and John J. Chattaway, Springfield, Mass.

First, We claim the use of a swab of rubber, or other similar elastic material, when the same is expanded laterally by vertical compression within the barrel for the purpose of cleaning the same, substantially as herein set forth.

Second, The combination of the springs, b b, with the other parts of the device for the purpose of holding the swab in place when compressed and expanded, substantially as herein described.

56,560.—WATER WHEEL.—R. S. Holeton, Niles, O.

I claim the arrangement of the penstock, G, within the flume, C, and the wheel within the said penstock, in combination with the cap, A, side openings, e e, gate, G', below the wheels, lever, a, and rod, b, in the manner and for the purpose set forth.

56,561.—MACHINE FOR MAKING METAL TUBES.—Horace Hotchkiss, Plainfield, N. Y.

First, I claim in machines for bending plates of metal into convex or tubular forms, the combination of the guide spindle, M, constructed as described, with a system of guides of suitable form for the different stages of the work, and a system of rolls, or their equivalents, between which the work is formed into the required shape, substantially as described.

Second, I also claim the guide spindle, M, constructed and applied substantially as and for the purpose described.

Third, I also claim the rolls, N O, constructed and operating in the combination shown, substantially as described.

56,562.—TRUSS.—T. L. Hough, Philadelphia, Pa.

I claim the arm, C, pivoted upon the journal, c, having the spring, a, attached thereto with its free end operating against the plate, B, substantially as shown and described.

56,563.—PAVEMENT.—D. Huestis, Cold Spring, N. Y.

I claim the grooved street pavement herein described, the same consisting of the boxes, A, with the bottom flanges, c, and dovetail spaces, d, with suitable filling, the upper edges being beveled and forming grooves when the boxes are combined and give hold to the feet of the animals, and adapted for a railway track, as specified and shown.

56,564.—KNIFE SCOURER.—H. B. Hutchins and Washington Horter, Philadelphia, Pa.

We claim as an improved article of manufacture, the knife and fork cleaner or scourer, described as set forth.

56,565.—LAST.—S. T. Hutchins, North Anson, Me.

I claim the self-operating spring clasps, d, and projection, e, combined and operating together to hold and to release the last block, substantially as described.

56,566.—STOVEPIPE DAMPER.—J. A. Jacobs, Pittsfield, N. H.

I claim a heat regulator composed of two grates, A B, which are connected by sliding and revolving crank shaft, C, substantially as and for the purpose described.

56,567.—LANTERN.—E. N. Jenkins, Chicago, Ill.

First, I claim the band, D, provided with a plate or disk, E, for supporting a lantern globe, substantially as set forth.

Second, I claim the combination of the band, D, disk, E, and springs, a, or lodges, c, with the base, C, substantially as and for the purposes specified.

56,568.—WATER DRAWER.—M. W. Jenks, Richmond, Ind.

I claim the arrangement of the several parts in combination, as hereinbefore specified and set forth.

56,569.—HAT RACK.—C. H. Keener, Baltimore, Md,

I claim the hat rack, consisting of the ring, A, with loop, a, hanging in eye, b, substantially as described, for the purpose specified.

56,570.—BED BOTTOM.—C. A. Kellogg, Elyria, Ohio.

I claim the staple, D, pin, E, and belt or strap, F, in combination with the gripe, G, and slat, B, as and for the purpose substantially as set forth.

56,571.—TURN-TABLE.—J.B. Kelly, Kendallville, Ind.

First, I claim the yoking ring, G, in combination with conical rollers and a concentric rail or rails, substantially as and for the purpose herein described.

Second, The conical flanged wheels and beveled rails, in combination with the central ring, G, fixed center post, E', and a turning table, E, substantially as described.

56,572.—WATER WHEEL.—T. J. Kindleberger, Eaton, Ohio.

First, I claim the circular bar, d', connecting links, e and f, gates, a' and b', and guide boxes, d'', combined and arranged as above described and for the purpose set forth.

Second, The worm, w, rack, x, arms, u, valve, r, with disk, t, combined and operating as above shown and for the purpose set forth.

Third, The main driving wheel, C, auxiliary wheel, D, both upon main driving shaft, B, in combination with shoots, d and b, and gates, a' and b', for the purpose above specified.

56,573.—ROBE.—Julius Klamke, New York City.

I claim a traveling or other robe, of fur or other material, having pockets or receptacles for the hands and feet, or either, as herein described or and represented, so that it may be used as a garment without interfering with any or all of its uses as a robe, as set forth.

56,574.—RENOVATING FADED FABRICS.—Rudolph H. Klauder, Philadelphia, Pa.

I claim the herein set forth combination of the processes of dyeing and opaque printing as a new and improved method of renovating worn or faded woven fabrics, whereby the described improved effects are produced, as and for the purpose specified.

56,575.—WATCH AND LOCKET CASE.—J. G. Konvalinka, Astoria, N. Y.

I claim, First, The movable head, C, fitted or mounted on a fixed pin, A, substantially as and for the purpose specified.

Second, I also claim the spring, D, in combination with the movable head, C, and fixed pin, A, and operating substantially as and for the purpose above specified.

Third, I also claim the catch, G, when it is movable, i e., sliding up and down and operating substantially as and for the purpose above specified.

Fourth, I also claim the spring, M, bent externally over the cap, H, and operating substantially as and for the purpose above specified.

Fifth, I also claim the bridge, O, fastened externally upon the cap, H, substantially as and for the purpose above specified.

56,576.—METHOD OF PREVENTING SEALING-WAX FROM ADHERING TO MOLDS.—Noah W. Kumler, Dayton, O.

I claim the application of quicksilver in the manner and for the purposes herein respectively set forth.

56,577. — ROCK-DRILLING MACHINE. — Perley H. Lawrence, Springfield, Mass.

I claim, First, Attaching to the lower end of a drill-pipe a weight or sinker, when the same is arranged in the manner and operated as and for the purpose herein described.

Second, Placing the spring, A, of rubber or its equivalent, between the pipe, X, and sinker, B, when the same is arranged substantially in the manner and for the purposes herein set forth.

Third, Connecting the parts of the sinker, B, by means of the joint, C D, substantially as herein described.

Fourth, Attaching the piston, G, to the frame of the machine, L, by means of the rod, H, pin, K, and collar, J, and using it in combination with the pipe, X, in the manner and for the purpose set forth.

56,578.—CIGAR PRESS.—Martin Leippe, Lancaster, Pa. Antedated Feb. 23, 1866.

I claim the form boards 1, 11, 111, 1111, constructed and employed substantially in the manner shown and for the purpose specified.

56,579.—PORCELAIN PICTURE FRAME.—C. L. Lochman, Carlisle, Pa.

I claim, First, The combination of the slotted lid, B, with the movable bars, G G, mounted with leather, gum or other elastic cushion to grasp the two opposite edges of the porcelain plate, in the manner shown and described and for the purpose set forth.

Second, The combination of the frame, B, negative holder, F F, spring, d, slotted hinged lid, B, with its movable bars, G G, and springs, f f, arranged, constructed, and operating in the manner substantially as shown and described.

Third, The movable bars, G G, with their accompanying screws and burs moving in slots as represented, or their equivalents.

Fourth, A movable negative holder, F F, with spring, s, and fastening screw, E.

56,580.—GRAIN BINDER.—S. D. Locke, Janesville, Wis.

I claim, First, A binding machine operated by hand or by power taken from a harvester, provided with a cam cylinder, B, and the cam slides K, operating sets of arms, as M N E, alternately, and a sheaf-discharging arm, F', combined with a disengaging coupling, C, and a self-acting disengaging arm, E, foot lever, I, binding arms, T U, and the friction reel, A', when arranged and used in the manner and for the purposes herein set forth and described.

Second, Disengaging couplings of grain-binding machines by means of the disengaging arm, E, when constructed with or without the shaft springs, E, as set forth herein and described.

Third, The cam cylinder, B, when constructed substantially as described, and used to operate the working parts of a grain-binding machine, substantially in the manner as herein set forth and described.

Fourth, The cam slides, K, when constructed substantially as described, with or without the friction roll, and used to communicate motion to the working parts of a grain-binding machine, substantially as herein described.

Fifth, The foot lever, I, or equivalent device, used to raise or remove the disengaging arm of a grain-binding machine, so as to allow the couplings to be engaged, as herein described and set forth.

Sixth, I claim the combination of a back-acting disengaging coupling, with a shaft-spring and the disengaging arm, E, the combination operating so as to allow a backward motion to the harvester without affecting the process of binding or operating the parts of a binding machine, substantially as set forth.

Seventh, I claim the combination of the back-acting disengaging coupling, the shaft spring, with a disengaging arm and a disengaging lever, substantially as set forth.

Eighth, I claim the combination of a revolving cam cylinder and its moving mechanism with the vibrating arm, R, for operating a twisting or tying device, the parts being constructed and operated substantially as herein set forth.

Ninth, I claim the combination of a revolving cam cylinder with vibrating binding arms, and a vibrating arm operating a twisting or tying device, arranged and operating as described, whereby the binding arms and the twisting or tying arm are worked alternately, substantially as set forth.

56,581.—QUARTZ CRUSHER.—John Mabbs, Isle Royal Mines, Mich,

I claim, First, The feed-table, J, mounted in the tubular shaft H, in combination with the mullers, F, and main shaft, B, constructed and operating substantially as and for the purposes described.

Second, The plow, L, in combination with the feed-table, J, tubular shaft, H, and horizontal shaft, E, constructed and operating substantially as and for the purposes set forth.

Third, The tank, O, in combination with the plow, L, feed-table, J, and mullers, F, constructed and operating substantially as and for the purposes described.

56,582.—TWEER.—James F. Maguire, East Boston, Mass.

I claim a tweer, constructed substantially as described, and for the purpose set forth.

56,583.—THRESHING AND HULLING CLOVER.—M. H. Mansfield, Ashland, O.

First, I claim, in a threshing or clover hulling and threshing machine, which employs a fan, G, for blasting or blowing away chaff, dust, and other foreign substances, the construction and arrangement of the dust chambers, b, situated within the frame of the machine, apertures, b, fan, b3, and discharge passage at a', all substantially as and for the purpose described.

Second, The construction of the shoe, E, with the imperforated boards, e e', said boards being arranged as described and shown for the purpose set forth.

56,584.—PLOW.—Hubbard Martin, Jeffersonville, Ind.

First, I claim the wrought iron angle beam, A, connected to the mold board, s, by the angle bar, D, and the rod, E, all constructed and arranged substantially as and for the purpose set forth.

Second, The clevis, H, provided with an upper elastic plate, c, in combination with the notched plate, g, attached to the beam, substantially as and for the purpose specified.

Third, The wrought iron handles, B B', in combination with the angle beam, A, substantially as and for the purpose set forth.

56,585.—EVAPORATOR.—Silas B. Maulsby, Muncie, Ind.

I claim, First, The graduating self-straining step pan, I, constructed substantially as herein described, in combination with the furnace, for the purposes set forth.

Second, The revolving finishing pans, N, supported by and revolving upon cranes, substantially as herein described, in combination with the step pan, I, and with the furnace, for the purposes set forth.

56,586.—WAGON HUB.—W. McClelland, Springfield, Ill.

I claim, First, Constructing the hubs of vehicles of wood for receiving the tenons of the spokes, and encasing the same by metallic disks, substantially in the manner and for the purpose set forth.

Second, In combination with the disks, C and C', I claim the pipe boxing, D, arranged substantially as and for the purpose set forth.

Third, In combination with the spindle E, flange, C2, and pipe boxing, D, I claim the cap, I, substantially as set forth.

Fourth, In combination with the wooden hub, A, and metallic disks, C and C', I claim the bolts, H, or their equivalent, substantially as and for the purposes set forth.

56,587.—METALLIC PAPER FASTENER.—George W. McGill, Washington, D. C.

I claim the within described paper fastener, formed of a single piece or strip of metal bent in a T-shape, the ends of the strip being in close contact, and pointed so as to make only a single hole in the paper, which it is designed to connect, the two ends opening from each other after passing through the papers, and confining said papers between said ends and the arms of the T, substantially as set forth.

56,588.—PRESS.—James A. McGillivrae, Dyer, Ind.

I claim, First, The connecting rim, i, of the wheel, P, with the shaft, Q, of the windlass, by means of the metal spider, R, in combination with the loose drum, V, on shaft, Q, and the slide, V, or an equivalent fastening, to engage with the arms, j, of the spider, substantially as set forth.

Second, The attaching of metal rim, h, to the flange, g, of the wheel, P, in combination with the slide, O, substantially as and for the purpose specified.

Third, The bar, S, attached to the rim, i, of wheel, P, by a joint, l, in combination with the cleats, m m, on the said rim, the slide, O, and the inclined curved bar, T, attached to the framing of the windlass, substantially as and for the purpose set forth.

56,589.—HARVESTER CUTTER SHARPENER.—J. McKnight, Pomeroy, Ohio.

I claim the right-angular arms, C D, in combination with the rod, B, handle, A, nut, b, head, a, constructed and arranged in the manner and for the purpose herein specified.

56,590.—BUCKLE.—John McClellan, Chambersburg, Pa.

I claim the plate, A, with its guard, B and C, in combination with the sliding catch, F, the whole being constructed and arranged for the reception and retention of straps, x y, substantially as described.

56,591.—CLOTHES WRINGER.—Wm. T. McMillen, Cincinnati, Ohio, and Edward P. Conrick, Delavan, Wis.

We claim the counter shaft, F, having pinions, E E', at both ends, in the described combination with the pair of doubly-geared wringer rolls, A C C' and D D D', for the purpose explained.

56,592.—SASH FASTENING.—W. M. Merriel, Jefferson, Ind.

I claim the application of a spring, F, of suitable construction, in combination with the screw-bolt, G, to the cog wheel, D, whereby the window is prevented from moving unless forced, other than its own gravity, is exerted upon it, substantially as specified.

56,593.—PRINTING ON BOTTLES.—Isaac L. Miles, Charlestown, Mass.

I claim the within described apparatus, consisting of the adjustable bed, C, with its elastic type block, D, ways, M, and gauge, I, operating substantially as and for the purpose set forth.

56,594.—RAILROAD CARS.—Ezra Miller, Brooklyn, N. Y.

First, I claim constructing the platform of railroad cars, in a horizontal plane with the car beds, and sustaining such platforms by means of trussed rods, substantially in the manner described.

Second, The cross timbers, a a', a2, applied to the two intermediate longitudinal platform beams, C' C', substantially as and for the purpose described.

Third, The construction of spring buffers and couplings, substantially as herein described, to produce compression between cars when are coupled together, so that the spring buffers and couplings shall constantly act together to prevent shocks and jerks in starting, stopping or running trains, said buffers and couplings being arranged substantially as set forth.

Fourth, Constructing the hooks, D, partly of cast metal and partly of wrought metal, substantially as described.

Fifth, Chilling the abutting faces of the coupling hooks, D, substantially for the purpose described.

Sixth, Facing the abutting surfaces of the buffer heads with a metal which is harder than that of which the heads are formed, substantially as described.

56,595.—MODE OF GRANULATING FURNACE SLAG.—Charles E. Morris and John Eymon, Bridgeport, Pa.

We claim granulating furnace slag, by running it in its hot, fluid condition, from the furnace, directly into any suitable receiver containing cold water, substantially in the manner described.

56,596.—EXTRACTING SPECIMENS OF LIQUORS.—Joseph M. Naglee, Philadelphia, Pa.

I claim the combination of the reservoir tube, A, and its valve, t, with the elastic air vessel, C, and its valves, c c', the whole being constructed and operating substantially as and for the purpose described.

56,597.—SIPHON.—Joseph M. Naglee, Philadelphia, Pa.

I claim, First, The elastic air vessel, c, and valve, c c', combined with a siphon, substantially as and for the purposes described.

Second, The combination of the adjustable rod, g, with the short arm of a siphon, substantially as set forth for the purpose specified.

56,598.—WIND WHEEL.—C. Nickerson, Chenoa, Ill.

I claim a wind wheel composed of two series or sets of fixed wings or rails, C C', secured between heads, B B, one set for series projecting out from the heads further than the other set or series, and placed alternately in position, substantially as shown and described.

56,599.—DIE FOR MAKING EYEBOLTS FOR VESSELS.—Charles Norton, New Haven, Conn.

I claim the combination of the lower die, A B and C, with the upper die, A' B' and C', when constructed, arranged and fitted for making eyebolts, substantially as herein described.

56,600.—HAND SPINNING MACHINE.—Thomas G. Odell and Boyd Glover, Camp Point, Ill.

We claim, First, The arrangement of the frame, D, made as described, the cog wheel, C, pinion, B, band pulley, A, and spin-

die, F, the whole forming a portable spinning machine for domestic use, substantially as above set forth.

Second, In combination with the above, we also claim the adjustable plate, G, for holding the spindle, made and applied to the frame, D, as described.

56,601.—Anti-friction Carriage Axles.—Edmund C. Otis, Voluntown, Conn.

I claim the combination of the two rolls, B B, fixed to the axle, A, so as to operate within the hub, D, substantially as and for the purpose specified.

56,602.—Die for Forming Heads of Wrenches.—Henry W. Pell, Rome, N. Y.

I claim the improvement in the manufacture of wrenches herein described, the same consisting in subjecting the bar of iron from which the wrench is to be made to the action of the consecutive set of dies, substantially as described, and in the manner and for the purpose set forth.

56,603.—Inkstand and Calendar Combined.—Geo. G. Percival, M. D., Brooklyn, N. Y. Antedated July 19, 1866.

I claim the calendar constructed and arranged as herein specified in the described combination with the inkstand, A.

56,604.—Hand Lantern.—George Peugeot, Buffalo, N. Y.

I claim the manner of attaching the glass globe to the wire frame by means of the vertical wires, B C, hooking on to the knobs, G G, or into or under the bottom of the glass as shown at L M, substantially as described.

56,605.—Flour Packer.—Oscar Place, Brooklyn, N. Y.

I claim the arrangement of the perforated sliding plates, R S, provided with lever, T, having adjustable bearing, V, perforated places, M N H I, in combination with the sliding tubes, K, applied with the movable frame, G, and sliding frame, L, operating in the manner substantially as described and for the purpose set forth.

56,606.—Shackle for Carriage Tongues.—F. R. Pollard, Canaan, N. H.

I claim a pivoted catch combined with the end of a carriage tongue, substantially in the manner and for the purpose herein set forth.

56,607.—Collar for Drill Rods.—W. T. Priest, Decatur, Ill.

First, I claim the combination of the section, A', and grooved bed section, A, connected by a screw joint, with the inclined or mitred key, I, and key seat, C, the adjustable band, F, and groove, H, substantially as described.

Second, I also claim the grooves, D, and recesses, E, in the upper section or rod, A, in combination with the band, F, having internal pins, G, substantially as described.

56,608.—Making Brick.—Thomas C. Prosser, Bay City, Mich.

I claim the forming of the materials in which hydraulic lime is one of them proportioned or varied as above into separate and individual bricks as described, to be used for and applied to the purposes hereinbefore set forth.

56,609.—Boiler for Culinary Purposes.—T. T. Prosser, Chicago, Ill.

First, I claim the shallow chamber, C, below and connected with the inner and main chamber, E, by the opening, s, and with the upper and exterior reservoir, B, substantially as and for the purpose set forth.

Second, The combination and arrangement of the chambers and movable cover, for the purposes hereinbefore set forth.

56,610.—Shirt Collar Attachment.—James Proud, New York City.

I claim the plate, C, having opening, D E, and hooks, F, made as described for the purpose specified.

56,611.—Mode of Manufacturing Harness Nails.—Frederick Reynolds, Newark, N. J.

I claim an improved mode of forming and plating the soft metal heads of harness nails, substantially as herein described.

56,612.—Sewing Buttons to Garments.—J. W. Roberts, New Monmouth, N. J.

I claim the spring staple, B, with barbed ends, b b, in combination with the slotted button back or the washer, E, operating substantially as described.

I also claim in combination with the barbed staple and elastic washer, D, applied substantially in the manner and for the purpose set forth.

56,613.—Gang Plows.—William T. Rogers, Quincy, Ill.

I claim, First, The manner as hereinbefore set forth, of securing gang plows or cultivator beams upon a carriage that can be used to support either or both by means of the bangers, F, guide, F, and braces, f f, or their equivalents in combination with the rods, E E, arranged and operating substantially as and for the purpose described.

Second, I claim the seat bars, B, with their clevises, L, or an equivalent in combination with the manner as hereinbefore set forth, of regulating the seat to suit the inclination of the bars by means of the rocker, M, and adjusting standard m, with supporting and locking pins, or their equivalents.

56,614.—Cross Head for Blowers.—P. H. Roots, and F. M. Roots, Connersville, Ind.

I claim a piston constructed of cross head, A, fastened to a shaft, B, in combination with wooden lags or strips, C, which are secured to the cross heads, substantially as and for the purpose set forth.

56,615.—Knife and Scissors Sharpener.—James J. Russ, Worcester, Mass.

I claim the combination of the stand or holder, A, having inclined slots, E, and the sharpener plates, B, when arranged and connected together, substantially as and for the purpose described.

I also claim the stand or holder, A, slotted in an angular direction and notched at F, in combination with the sharpener plate, B, the whole together forming a combined knife and scissors sharpener, substantially as and for the purpose described.

56,616.—Padlock.—Cyrus W. Saladee, Newark, Ohio.

I claim, First, The shield plate, A, with key slot, D, in combination with the lock plate, B, and spring, J, constructed and operating as described and for the purposes set forth.

Second, I claim the stud, F, and spring, J, as arranged in combination with the lock plate, B, and slot, d', and hasp, C, and covers S, of the key hole, operating as described and for the purpose set forth.

Third, I claim arranging the wards 9 and 10, on the shield plate, A, for the purposes set forth and operating as specified.

Fourth, I claim the key constructed with hook, I, as described, in combination with key slot, D, and lock plate, B, and spring, J, constructed and operating as set forth.

Fifth, I claim the stud, F, or its equivalent, in combination with the lock plate, B, and spring, J in the manner and for the purpose substantially as shown and described.

56,617.—Padlock.—Cyrus W. Saladee, Newark, Ohio.

I claim the shield plate, N, provided with the guard ring, C, and otherwise constructed in the manner and for the purpose substantially as s own and described.

56,618.—Finger, Scarf and Napkin Rings.—L. Sauter, Jersey City, N. J.

I claim the annular sliding band, C, furnished with opening, f', and applied in combination with the hollow body, a b, furnished at its outer circumference with -n-gs, C', substantially as herein set forth for the purpose specified.

56,619.—Over-check Driving Rein.—L. G. Sayre, Cincinnati, Ohio.

I claim the provision in connection with a bit, A, and bridle of the ordinary form, of the independent upward bearing bit, F, suspended from the over-check, G, in the described combination with the check or safety rein, I, substantially as set forth.

56,620.—Method of Packing Nitroleum and Nitro-glycerin.—Taliaferro P. Shaffner, Louisville, Ky.

I claim, First, The placing between a bottle containing nitroleum, nitro-glycerin or other liquid combustible compound and an outer casing or box, india-rubber or caoutchouc or either material to serve as springs for the purpose of lessening concussion upon the said liquid substance by an exterior force resulting from a pull or otherwise, substantially as hereinbefore described

Second, I claim the application of plaster of paris powder or of other equivalent non-conductor of heat and non-explosive or combustible substance when saturated with the liquids hereinbefore mentioned, in combination with the arrangements or parts, substantially as hereinbefore described.

Third, I claim the use of metallic bottles for the purpose of confining the nitroleum, nitro-glycerin or other explosive liquid, in combination with the arrangements and parts, substantially as hereinbefore described.

56,621.—Hame Fastener.—M. R. Sholters, Alliance, Ohio.

First, I claim the loop, B, provided with lips and slots, the hooks, A, pivoted to the arms, a a, arranged and operating conjointly, as and for the purpose substantially set forth.

Second, I claim hook, A, finger, c, and thumb piece, F, in combination with the pin, D, arms, a a, and loop, B, arranged as and for the purpose set forth.

56,622.—Dies for Manufacturing Tin-lined Lead Pipes.—W. Anthony Shaw, New York City.

I claim, First, Insuring a lining of tin of uniform thickness by providing an escape for the lead, either through the cylinder, die, or ram.

Second, I claim the die, A, in combination with the pipe, H, when the two are constructed and arranged in relation to each other, substantially as described.

56,623.—Driving Well Tubes.—Calvin Shepard, Hatterville, N. Y.

I claim, First, The combination of the tube, A, constructed as described, with the flange, F, the collar, E, and platform, D, suspended therefrom, all arranged and operating in the manner and for the purpose herein specified and shown.

Second, I also claim the platform, D, supported on the flange, F, as shown in combination with the well tube, substantially as described.

56,624.—Mode of Lubricating Journal Boxes.—Albert R. Sherman, Natick, R. I.

I claim the caps, D, and scrapers, c, in combination with the shaft, C, and box, A, constructed and operating substantially as and for the purposes described.

56,625.—Water-proof Fabric.—John Snare, New York City.

I claim the water-proof or compound fabric adapted to the purposes specified, and formed of laminæ of mica, cemented to flexible material, as specified.

56,626.—Peat Machine.—M. B. Stafford, New York City.

I claim, First, The constructing of the molds, c, of two longitudinal parts or halves connected by hinges and so arranged as to form an endless chain of molds to work over rollers and receive the peat or other substance to be compressed and to discharge the same, after being compressed, by passing over the roller at the discharge, and of the framing, substantially as set forth.

Second, The plunger, F, operated as shown in combination with the endless chain of molds, substantially as and for the purpose specified.

Third, The hopper, M, provided with one or more partitions, I, provided with teeth, m, at their lower edges, in combination with the endless chain molds, C, substantially as and for the purpose set forth.

56,627.—Pump.—Joseph A. Stansbury, Baldwinsville, N. Y.

I claim the combination of the right-angled wings, g g, attached to and turning with the same shaft, and the guide, G, when said parts are used in connection with a pump, substantially as herein specified.

I also claim the butment made up of the parts, m and n, in combination with the wings, g g, operating substantially as herein set forth.

I also claim the spring, l, in combination with the wings, g g, and guide, G, operating substantially as specified.

I also claim in combination with the wings, g g, and the shaft, f, the hub, D, provided with the flange, d, substantially as described.

I also claim the arrangement as a whole, consisting of wings, g g, guide, G, butment, m n, hub, D, and spring, l.

56,628.—Wrench.—Robert S. Stenton, Brooklyn, N. Y.

I claim arranging the jaws upon a straight shank, whether the former be perpendicular or inclined to the latter, and operating the movable jaw by a screw supported at its lower end in a step formed in the solid metal of the shank, and with a rosette, or its equivalent, for turning the same located and contiguous to said step, all constructed substantially as set forth.

56,629.—Process of Burning Gas for the Production of Heat, Light, Etc.—Simon Stevens, New York City.

I claim the mixture of steam with coal gas or other gases produced by distillation of hydrocarbon substances, or their equivalents, so as to render it more useful for the production of heat and light, as herein described.

56,630.—Curtain Fixture.—J. Leverance Stewart and Samuel R. Pierce, Homer, N. Y. Antedated July 15, 1866.

We claim, First, The break block, G, constructed substantially as and for the purposes herein set forth.

Second, The combination of the roller, C, the break, E, the cord, L, with weight, H, attached, the several parts being arranged substantially as and for the purposes specified.

56,631.—Adjustable Pitmen for Presses, Punches, Etc.—Norman C. Stiles, Meriden, Conn.

I claim the two unequally-spaced series of grooves, m n, arranged to operate together by the aid of one or more keys, G, fitted into any desired pairs of grooves, so as to compel the same to coincide and to hold the parts very firmly with great nicety of adjustment, substantially in the manner and for the purpose herein set forth.

56,632.—Table.—Thomas B. Stout, Keyport, N. J.

I claim the supports, f f h h, applied to the end leaves, and to the frame work, substantially as and for the purposes herein specified.

I also claim the combination of the supports, f f h h, "governors," m m, and slide bearings, g g i i, substantially as and for the purpose herein set forth.

I also claim the combination and arrangement of the battens, C C, coupling pins, c c, and leaves, A A, and D D, substantially as and for the purpose set forth.

56,633.—Method of Destroying Lice on Trees.—M. O. Sullivan, Thompson Station, Ill.

I claim the ingredients herein described, when compounded substantially as and for the purpose set forth.

56,634.—Water Elevator.—L. Taylor, Jordan, Wis.

I claim, first, the arrangement and combination of the carriage, N, carrying a water bucket, strands, K, receptacles, E H, pipe, G, rope, J, and windlass, I, for elevating water to the upper apartments of a house, substantially as shown.

Second, I also claim the carriage, N, shown in figures 1, 2, and 4, having wheels, O, pulleys, O2, an opening, c, to receive the head, F', of the float, and locking pins to lock the head when the carriage is drawn upward along the strands, K, substantially as described.

Third, I also claim the float, E, placed over the bucket, substantially as described, and having a head, F', with a pulley to allow it to be suspended by rope, J, as shown.

56,635.—Reducing Oxide of Lead.—Thomas Taylor, Washington, D. C.

I claim, first, The protoxide of lead as a flux in the reduction of lead dross, substantially for the purpose and in the manner herein set forth.

Second, The use of iron as a deoxidizer of the protoxide of lead, substantially for the purpose and in the manner herein set forth.

56,636.—Gold Separator.—Charles F. Testman, Portland, Oregon.

I claim three things—the first is the process of drying dirt in the boxes, a a and b b, by means of the fire, e; the second is the application of the spatulas, o o, to the roller, m, and the third is the method of constructing the amalgamating pans, r r, and procuring thereof the gold dust in the quicksilver pockets by means of the continued revolution of the stirrer, q q.

56,637.—Pump.—Daniel M. Thomas, Dowagiac, Mich.

I claim, first, The arrangement of the plunger chamber, B, so as to communicate with the induction chamber, E, and its upper end, and the side passage, D, which leads to the receiving chamber, G, substantially as described.

Second, In combination with a force pump, which is constructed with upper and lower inflow chambers, leading to the main piston chambers, I claim the application of a safety valve, h, to the vertical discharge pipe, H, substantially as described.

Third, The vibrating frame, C, connected to the working beam, L, by means of flexible connections, I I, in combination with the segments, J J', and pendulum, J2, for operating the pump pistons, substantially as described.

56,638.—Trace Buckle.—W. McK. Thornton, Clinton, Wis.

I claim the frame, A, constructed of two longitudinal bars, a a, and two transverse bars, b' b', in combination with the pin, g, and spring tongue, C, all arranged in the manner substantially as described.

56,639.—Lock for Receiving Throttle Valves.—C. C. Torrence, Ripley, Ohio.

I claim the combination of the lock, D, slotted guard, C, and the valve lever, A, substantially as described.

56,640.—Broom Head.—Harvey Trumbull, Central College, Ohio.

I claim the jaws, A and C, the screw b, the nut, d, and ferrule, E, the whole arranged and constructed in the manner and for the purpose substantially as herein described.

56,641.—Sewing Machine.—Joseph C. Tucker, San Francisco, Cal.

I claim, first, The combination of a rocking, perforating needle carrying arm, with one or more adjustable perforating needle carrying arms, substantially as described.

Second, The combination of the lower thread carrying looper, working in fixed bearings with one or more loopers, the bearings of which are capable of being adjusted substantially as and for the purpose set forth.

Third, The combination with the rocking arm of a sewing machine provided with a perforating needle of one or more adjustable needle carrying arms above the table, and a looper working in fixed bearings below the table, and one or more loopers in adjustable bearings for making parallel lines of stitching, substantially as described.

Fourth, In combination with the rocking arm of a sewing machine carrying a perforating needle, and provided with one or more adjustable needle carrying arms, I claim a stationary arm provided with one presser, held in fixed bearings, and one or more in adjustable bearings, substantially as described.

56,642.—Sash Fastener.—F. B. Van Vleck and G Nichols, Plainfield, N. J.

We claim the thumb piece, e, passing through a mortise in the plate, c, and connected to the bent lever, f, in combination with the lifter, d, bolt, g, and spring, k, the parts being arranged and acting as and for the purposes set forth.

56,643.—Braiding Machine.—Florence L. Veerkamp and Charles F. Leopold, Philadelphia, Pa.

We claim, first, In a braiding machine, two sets of spools, M and I, caused to traverse in contrary directions in concentric annular parts when the threads of the two sets of spools are made to cross each other and be plaited by the devices herein described or any equivalent to the same, for the purpose specified.

Second, The plate, P, with its radial recesses, y, in combination with the cam plate, P, and its wires or projections, u, the whole being constructed, arranged, and operating substantially as and for the purpose herein set forth.

Third, The combination substantially as described of the shuttle or spool carrier, A, and its guard rod, K, for the purpose specified.

56,644.—Washing Machine.—F. W. Vosmer, Cincinnati, Ohio.

I claim, first, A batten consisting of the parts, J N O P P', in combination with the external lever, I, and connecting arm, M, all arranged and operating in the manner herein described and set forth.

Second, I claim the corrugated lid, D, hinged to a permanent support, E G, and otherwise arranged substantially as herein set forth to adapt it for use as a washboard.

56,645.—Writing Pen.—Samuel Warrington, Philadelphia, Pa.

I claim a pen, A, having curves, c and c, and flanges, x x, when the said curves and flanges are formed and arranged in respect to the nib and shank of the pen, as and for the purpose described.

56,646.—Sewing Machine.—Albin Warth, Stapleton, N. Y.

I claim, first, The arrangement of a friction spring in combination with the vibrating needle arm, constructed and operating substantially as and for the purpose set forth.

Second, The arrangement with said spring of a set screw or other equivalent fastening in combination with the vibrating needle arm, constructed and operating substantially as and for the purpose described.

Third, The arrangement of a lip, S, extending from the needle holder on the back of the needle, substantially as and for the purpose set forth.

Fourth, The guard, g, applied to the top edge of the bobbin holder, M, substantially as and for the purpose set forth.

Fifth, The friction brush, e', or its equivalent, in combination with the bobbin, K, and bobbin holder, M, constructed and operating substantially as and for the purpose described.

Sixth, In combination with a Wheeler & Wilson Sewing Machine, when such machine is so constructed that the needle is made to feed the material, I claim the devices herein shown or their equivalents for producing a chain stitch.

Seventh, The protector, n', in combination with the revolving hook, I, and chain stitch mechanism, constructed and operating substantially as and for the purpose set forth.

Eighth, The side surface cam, N, in combination with the chain stitch slide, h', spring, j', and stop lever, q', constructed and operating substantially as and for the purpose described.

56,647.—Lamp Shade.—James H. Webber, Charlestown, Mass.

I claim in combination with the ring, a, and its fingers, b, the wings, d, provided with recesses, e, for holding the ring, f, substantially as set forth.

56,648.—Shingle Machine.—Harry White, Oneida Castle, N. C.

I claim the combination and arrangement of the automatic feeding plate, V, the forked guide rod, C, with the adjusting rods,

R R, the whole being arranged for joint operation, substantially as described.

I also claim adjusting the knives to shave the shingles in the form described, by the means substantially as described.

56,649.—Stove.—Thomas White, Quincy, Mass.

I claim the arrangement in a heating stove of the straight flues, E F G H and I, in combination with the exit aperture and pipe, C, substantially as and for the purpose above described.

56,650.—Safety Paper.—James M. Wilcox, Glen Mills, Pa.

I claim paper having intermingled or united with the fibres of the sheet during the stage of the transformation from pulp to paper, or at any other time when such a thing can be done, of detached fibres or threads different from the ordinary fibres in such a way as to group or locate the introduced matter on any part or parts of the sheet while the remainder is left free or comparatively free from it, thereby forming one or more streaks or drops or clouds, or giving a general direction to said introduced fibres, or thereby producing any other distinctive mark or marks in the sheet or note.

56,651.—Cabinet Maker's Scraper.—Frank A., John H. & Daniel G. Williams, Cincinnati, Ohio.

We claim a scraper consisting of the blade, A, stock, B b, mouth piece, C, set screw, D, and clamping screws, E E, all constructed and arranged substantially as and for the purpose herein specified.

56,652.—Potato Washer.—Joshua H. Williams, East Craftsburg, Vt.

I claim the combination of the grate, D, with the pail, A, revolving shaft, C, and sweep, E, constructed and arranged in the manner and for the purpose herein specified.

56,653.—Fastening for Bottles.—Henry Wilson, Paterson, N. J. and James Wilson, New York City.

We claim the socket, a, in the bottle, A, in combination with the strap, B, substantially as and for the purpose described.

56,654.—Water Wheel.—John N. Wolfe, Lancaster, Ohio.

I claim, first, The buckets, B, constructed as herein set forth in combination with the openings, a a, substantially as specified.

Second, The combination of the gates, b b, constructed and operated as described with the chamber, C, and buckets, B, substantially as set forth.

56,655.—Coal Oil Burner.—Twentyman Wood, Westport, Conn.

First, I claim giving to the upper section of the shell a combined vertical and lateral movement, substantially as shown for the purpose indicated.

Second, Combining with the upper and lower sections of the burner the parallel levers attached as shown, when the same shall be combined substantially as herein described and for the purposes specified.

56,656.—Planing Machine.—James A. Woodbury, Boston, Mass.

I claim, first, So combining the yielding feed roll in a planing machine, with the weighted levers which control it, and when said roll is weighed and geared, so as to raise both ends of it at once, as that when the board runs out the weight of the levers shall be removed from said feed roll, and leave it simply suspended to or by the screws, so that it can be raised or lowered without raising or lowering the weight of the levers, and when constructed and operating substantially as described.

I also claim so combining and arranging the yielding feed roll of a planing machine with the gear for raising and lowering it, and when weighted as above claimed, as that while both ends of said roll will raise together by the gearing, yet neither end thereof can yield or rock in the line of its length, to conform to the varied thickness of the edges of the boards passed through under it, substantially as described and represented.

56,657.—Rotary Valve.—William E. Worthen, New York.

I claim a rotating steam valve provided with a cavity extending from the periphery to the face of the valve, as described, in combination with a seat, substantially such as described, and proper appliances as specified for holding the valve in its seat.

I also claim a rotating valve provided with two cavities substantially and as described in combination with proper appliances for holding the valve on its seat, a valve seat, and a chest provided with a steam passage, all substantially such as described, and all operating in combination as set forth.

I further claim, in combination with a rotating valve and a steam passage, an adjustable cut off ring, the combination being substantially such as specified and acting substantially as set forth.

56,658.—Piston Rod Packing.—Francis Wight, Galesburg, Ill.

I claim, first, The gasket, c, in combination with the bushing, b, sleeve, d, and steam chamber, e, constructed and operating substantially as and for the purpose described.

Second, The steam chamber, e, and channels, i, in combination with the packing rings, f, sleeve, d, and follower, g, constructed and operating substantially as and for the purpose described.

Third, The double inclined packing rings, f, as and for the purpose described.

56,659.—Grinding Mill.—Charles D. Young and James McLean, Waterloo, N. Y.

We claim the blast tubes, E E, having their ends, b b, opening outward in opposite directions in the extremities of the furrows of the bedstone to distribute the blast properly employed in combination with an exhaust tube, H, connected with the same fan case, G, for the extraction of moisture, as herein set forth.

56,660.—Marine Car.—George H. Young, Charlestown, Mass.

I claim the articulated pontoons or floats arranged in the form of one or more endless aprons, and traveling over suitable drums, in combination with the car, A, constructed and operating substantially as and for the purpose described.

56,661.—Churn.—John Young, Adrian, Ohio.

I claim the dasher, D, formed with the concentric channels, d d', and with perforations or apertures, G G, communicating with said channels in the manner and for the purposes explained.

56,662.—Sulky Plow.—Peter Young, El Paso, Ill.

First, I claim the cords, j and i, sliding rod, k, lever, F, and yoke, m, all arranged and operating as and for the purpose set forth.

Second, In combination with the above, I also claim the steadying lever, n, arranged and operating substantially as herein shown and described.

56,663.—Screw Plate.—Nicholas Zillier, New Castle, Del.

I claim an improved screw plate formed by combining with the two handled plate, A, the die holder, B, the dies, D, the spring, C, and the cap, E, the parts being constructed and arranged substantially as herein described and for the purpose set forth.

56,664.—Wheat Drill.—George Zorger, Greensburg, Ind.

I claim, first, The means employed for adjusting the arms, F F, to wit, the rods, G G, attached at their outer ends to the rear ends of the arms, E, and connected at their inner ends to opposite sides of a wheel, H, on a vertical shaft, I, which has an elastic handle or lever, J, attached to it, engaging with a notched semicircular bar, K, substantially as shown and described.

Second, The two wheels, B B, supporting the front end of the bar, A, in combination with the gearing, b c d E l k k, all arranged as shown and described for rotating the screws, N N O, as set forth.

Third, The slotted plates, S, in the hoppers, P, provided with the slides, T, for the purpose of regulating the flow or discharge of the seed as described.

Fourth, The securing in proper position of the seed conveying spouts, Q Q R, to the arms, F F, and bar, A, by means of the slotted plates, U, substantially as shown and described.

56,665.—Liquid Glue.—C. F. Binder (assignor to himself and J. Binder), Philadelphia, Pa.

I claim a liquid glue produced in the manner and by the process substantially as herein described.

56,666.—Snap Hook.—Henry Bradbury, Berlin, Conn., assignor to Neal, Wilcox & Company, Southington, Conn.

I claim a snap hook formed with a transverse cylinder or opening containing the spring, in combination with the snap or latch, c, and its end plates or fork, e, inclosing the said transverse cylinder, and composing the spring joint of the snap, substantially as set forth.

56,667.—Corn Planter.—J. F. Champlin (assignor to himself, S. B. Thomson, and D. C. Corbin), Aurora, N. Y.

I claim, first, The combination of the cam spring, H, lugs, J, and spring, I, for the purpose of operating the slide, G, substantially as described.

Second, The arrangement of the lever, N, in connection with the cam spring, H, for the purpose of moving the cam spring beyond the touch of the lugs, J, when desired, substantially as described.

Third, In a machine for planting corn in hills, in which the plow frame is made separate from the main supporting frame, I claim suspending the plow frame under the main frame by means of a pendant hinged connection to the forward end of the main frame, the combination with a rear upward projection bail or handle (in near proximity to the driver's seat) so that the driver can conveniently lift and suspend the plows from the ground when turning round at the end of the rows (or otherwise) and again drop the plows to the ground as required, substantially as described.

56,668.—Shears.—P. C. Clapp, Dorchester, Mass., assignor to himself and Cotton C. Bradbury, Milton, Mass.

I claim the scissors as made with the auxiliary blades, e f, arranged and combined with the blades, a b, and their handles, c d, substantially as specified.

56,669.—Breech-loading Fire Arm. — Jacob O'Connor (assignor to the Empire Breech-loading Fire Arms Company), New York.

I claim the hammer, F, formed with a curved back and throat, said curves being concentric with the axis, f, of the hammer, in combination with the curved upper side of the projection, l, and rear upper edge of the mortise, G, substantially as and for the purpose specified.

56,670.—Process of Vulcanizing India-Rubber in Connection with Leather.—Alexander Cutter (assignor to Charles H. Hayward), Malden, Mass.

I claim the improved process of treating leather and rubber, during the vulcanizing of the latter, such consisting in the employment of air, in the vulcanizing chamber or furnace, in sufficient quantity to prevent the heat thereof from injuring the leather without materially impairing its vulcanizing effect on the composition of rubber and sulphur.

56,671.—Pump.—Joseph W. Douglas (assignor to W. and B. Douglas), Middletown, Conn.

I claim the combination of the diaphragm, D, hollow piston rod, B, having a perforated enlargement, B', and piston, G, as described, valve H, with its spindle, d, and guide fingers, c, cylinder, L, and side-pipe, I, provided with valves, J and J', all arranged and operating substantially as described for the purpose specified.

56,672.—Smut Mill.—Robert Heneage (assignor to self and J. D. Shepard), Buffalo, N. Y.

I claim the rings, f f, of the rotating disks, E, when provided with radial or tangentially-inclined ribs, e e, or their equivalent, in combination with the stationary rings, h, and ribs, i, arranged and operating substantially as and for the purpose set forth.

In combination with the above described device, I also claim the vertical ribs, p p, on the interior of the case, together with the hopper-shaped diaphragms, B B, arranged and operating substantially as described.

I also claim the guard ring, g, in combination and concentric with the ribbed ring, h, for the purpose of deflecting the rebounding grain beyond the inclined ring beneath, arranged substantially as specified.

56,673.—Maple-Flavored Sugar and Syrup.—Charles McLean (assignor to himself, T. C. Hargraves, and Charles Mitchell), Boston, Mass.

I claim the within described new manufacture.

56,674.—Stencil Numbering Apparatus.—James M. Merritt (assignor to himself and John W. A. Myers), Buffalo, N. Y.

I claim the improved stencil numbering apparatus herein described, consisting of the plate or frame, A, with apertures, b c d, and the figure slides, 1 2 3, and guide f, or its equivalent, constructed and arranged substantially as described.

56,675.—Machine for Picking and Cleaning Cotton and Wool.—Stephen R. Parkhurst (assignor to Emily R. Parkhurst), Bloomfield, N. J.

First, I claim constructing the toothed rollers, b and c, with separate teeth set into grooves and secured as described.

Second, I claim the picker cylinder, formed of a series of longitudinally grooved bars, containing separate teeth and intermediate filling pieces, substantially as specified.

Third, I claim the cylinders d, f, and g, in combination with the strippers, h and i, substantially as and for the purposes specified.

Fourth, I claim the brush blower, l, and condensing cylinder, m', in combination with the picker cylinder, d, and cylinder, f or g, substantially as set forth.

Fifth, I claim the rollers, r r, in combination with the condensing cylinders, m' m', and oilers, t t, substantially as set forth.

Sixth, I claim, in a picker for wool and other fiber, arranging the stripper and toothed cylinder over the picker cylinder, so that dust and foreign substances shall fall into the space in which the picker cylinder revolves, and be thrown out by the centrifugal action of said cylinder, aided by a current of air, substantially as set forth.

56,676.—Clothes Wringer.—J. N. Pease and G. Lewis, Panama, N. Y., assignors to the "Metropolitan Washing Machine Co."

First, We claim the method of gearing wringer rolls, as herein shown and described—that is to say, by the employment in connecting with the pinions or cog-wheels of the upper and lower rolls of a third or auxiliary gear wheel—the whole being so arranged that, while the relative positions of the said pinions to each other may constantly vary, they shall bear permanent or fixed relations to the auxiliary gear.

Second, Supporting one of the wringer rolls in upright disks, the said roll having its bearings placed eccentrically to the said disk, in combination with the auxiliary gear when arranged, to revolve upon the axis of said disks, the whole being arranged for operation as herein shown and set forth.

Third, In combination with the herein described arrangement of gearing rolls, we claim the cross bar, or the mechanical equivalent thereof, for connecting the disks which support the movable rolls, so that the said disks may be moved upon their axes in unison, and maintain the parallelism of the rolls in the movement of the one to and from the other substantially as herein shown and described.

Fourth, The combination and arrangement of the spring and disks supporting the movable roll, substantially as herein shown and set forth, so that the rolls are kept together with a yielding pressure which may be regulated as described.

Fifth, We claim the herein described device for holding the wringer to the side of the tub, the same consisting of bell-crank levers pivoted on the machine, in combination with an adjusting rod, the whole being arranged for operation substantially as herein shown and set forth.

56,677.—Gas Stove.—Henry Pennie and E. A. Leland, New York City, assignor to said Pennie.

We claim, First, the burner or burners located within the stove, and burning air and gas, in combination with the opening, h, for the admission of air to support the flame and produce the draught, and with a chamber above the burner, constructed and arranged substantially as described, by which combination and arrangement the flame is carried downward and toward the opening of egress, as set forth.

Second, We claim, in combination with the burner, the openings, h, for draught and the chamber above, substantially as specified, the employment of the very small apertures, j, arranged essentially as set forth, for the purpose of admitting a comparatively small amount of air to mix with the volatile products of the flame, and assist the consumption of such products as they are carried downward and over the flame, by which the burner is made use of to consume its own products of combustion, substantially as described.

56,678.—Spring Bed Bottom.—Milton Roberts (assignor to himself and John A. Lloyd), St. Paul, Minn.

I claim the straining screws, b b, or their equivalents, in combination, with a thin slat bed bottom, substantially as deseri ed, for the purpose of increasing or diminishing at will the tension of said slats.

56,679. — Paper-Cutting Machine. — J. F. and George W. Tapley (assignors to themselves and G. D. Tapley), Springfield, Mass. Antedated Feb. 5, 1866.

We claim, First, The method herein described of cutting paper and similar substances in the form of an arc of a circle, for collars and other purposes, by means of a revolving or circular knife, and to travel in an arc of a circle, or similar curve on which the paper is to be cut, substantially in the manner herein set forth.

Second, Arranging the knife, b, in the handle, d, so as to be adjustable by means of the set screws, e e, substantially in the manner and for the purpose herein described.

Third, Arranging the indenting or printing wheel, D, in connection with the cutting knife, b, substantially as herein set forth.

Fourth, In combination with the wheel, D, the spreading roll or rolls g, and inking plate, E, when arranged substantially in the manner and for the purpose herein set forth.

56,680.—Method of Uniting Iron and Steel.—William and William H. Terwilliger, and John S. Lockwood, New York City.

We claim, First, The welded combination of iron and steel plates to make the shell of a safe, for safety against burglarious attacks.

Second, The process of welding iron and steel plates by the use of the composition of borax and saltpetre in paint form laid on the surfaces to be united, heated not above 1500° F., and rolled with great pressure, to make the best weld possible in the materials for burglar-proof safes.

Third, Interposing a steel plate between two iron plates, with the use of the welding composition and process above described, to make economical materials for burglar-proof safes.

Fourth, Interposing a plate of iron between two plates of steel, with the use of the welding composition and process above described, to make the strongest and best materials for burglar-proof safes.

Fifth, Constructing and preparing the materials for a burglar-proof safe by rolling and punching while hot, so that the parts of it can be put together after transportation in the manner described.

Sixth, Making a burglar-proof safe in mutually fitting parts, and numbered, so that, from a stock of the materials on hand, a safe of the desired size and strength could be put together in a few minutes in the manner described.

56,681.—Carriage Wheels.—Jacob Woodburn (assignor to himself and Thomas Scott), St. Louis, Mo.

I claim an oval or elliptical-shaped tenon for wheel spokes, in combination with a round-shaped mortise hole in the wheel rim therefor, substantially as herein described and for the purposes specified.

56,682.—Machine for Polishing Enameled Paper.—Wilbur F. Wright, Nashua, N. H., assignor to himself and Edwin B. Blood, Newburyport, Mass.

I claim, First, The combination of the two sets of rollers, H I and F G, when the roller, I, revolves at a higher velocity than the roller, G, substantially as herein set forth, for the purpose specified.

Second, The combination and arrangement of the pressing and smoothing rollers, C D, the burnishing roller, G I, and supporting rollers, F H, substantially as herein set forth, for the purpose specified.

56,683.—Watch.—Charles Lehmann, Bienne, Switzerland.

I claim the arrangement of the clutch, c c', in combination with the rod or stem, t, constructed as described, and capable of being connected to or disconnected immediately with the wheel which controls the mainspring, and with the minute wheel of the watch, substantially as herein set forth.

56,684.—Saw for Cotton Gin.—Thomas C. Craven, Albany, N. Y.

I claim a saw for cotton gins formed with rounded teeth of the character specified, as and for the purposes set forth.

56,685.—Manufacture of White Lead.—Thomas M. and Ambrose G. Fell (assignor to selves and William Bell), New York City.

First, We claim the treatment of sulphate of lead with alkaline substances, or their salts, in the manner and for the purposes substantially as above described.

Second, The treatment of the sulphate of lead with the carbonates of either potash, soda, or lime, followed by the alkaline substances, or their salts, in the manner and for the purposes substantially as above described.

Third, The treatment of sulphate of lead with the carbonate of soda or potash, in the manner and for the purposes substantially as described.

Fourth, The manufacture of white lead from ores of lead, or metallic lead, by the use of nitric and sulphuric acids, in combination with alkaline substances, or their salts, either with or without the prior treatment of carbonates of potash, soda, or lime, in the manner and for the purposes substantially as above set forth.

56,686.—Cooking Stove.—Esek Bussey, Troy, N. Y.

First, I claim the annular surrounding and downward projecting flange, F, or any equivalent thereof, in combination with the boiler or reservoir, A, in the manner substantially as and for the purposes herein described and set forth.

Second, I claim the apertures, d, in the boiler or reservoir, A, in combination with the exit flue or flues in the rear end of a cooking stove, in the manner and for the purposes substantially as herein described and set forth.

Third, I claim the arrangement and combination of the lid or cover, E, with the reservoir, A, so that the water or moisture on the under side thereof, by reason of condensation of steam, may and shall pass or drip into said boiler, A, in the manner substantially as herein described and set forth.

Fourth, I claim the arrangement and employment of the intermediate and vertical plate, F, in combination with the said reservoir, A, in the manner and for the purposes substantially as herein described and set forth.

REISSUES.

2,319.—Cooking Stove.—Esek Bussey, Troy, N. Y. Patented Dec. 5, 1865.

I claim, First, The outward continuation or extension of the top plate, E, of a cooking stove, over and upon, or near to the upper part or top boiler or reservoir, A, and containing therein an opening or reservoir aperture, E', for receiving into said boiler, A, in the manner substantially as herein described and set forth.

Second, I claim the supporting of the boiler or reservoir, A, upon the vertical end plate, C', in combination with the top plate, E,

of a cooking stove projecting or continuing outward with an opening or aperture, E, therein, or any equivalent therefor, in the manner and for the purposes substantially as herein described and set forth.

Third, I claim the employment of the boiler or reservoir, A, having its upper or open top or part in combination with the opening or aperture, E', in the top projecting plate, E, of a cooking stove, in the manner and for the purposes substantially as herein described and set forth.

Fourth, I claim the arrangement in a cooking stove, of a culinary boiler, and an exit passage for the gases of combustion, both at one end of the stove, and so that said boiler forms a part of the lateral casing, on the outer side of a fire flue, or fire flues in the end of the stove, below the said exit passage, in the manner substantially as and for the purposes herein described and set forth.

Fifth, I claim the employment and arrangement of the boiler or reservoir, A, or any equivalent thereof, within and upon the rear end of a cooking stove, and wholly or partly below the top plate thereof so that one side of such boiler, shall form and complete the lateral casing of the rear end vertical flue or flues below the top plate thereof, and the bottom of said boiler in the manner and for the purpose substantially as herein described and set forth.

Sixth, I claim the construction of the rear end, and vertical flue or flues of a cooking stove, by means of the boiler or reservoir, A, and the lower vertical end or boiler supporting plate, C', so that the hot air or escaping products of combustion shall come into direct contact with that part or portion of such boiler next adjoining such flue or flues so as to warm or heat the water or other material in said boiler, in the manner substantially as herein described and set forth.

Seventh, I claim the removing of the lateral or vertical outside casing of a cooking stove, or some part, or portion of the same, so that the hot air or heated products of combustion, may or shall come into contact with the boiler or reservoir or some part or portion thereof next adjoining thereto, or in combination therewith in the manner and for the purposes, substantially as herein described and set forth.

2,320.—Apparatus for Washing and Bleaching Fibrous and Textile Substances.—John G. Ford, Philadelphia, Pa., assignee by mesne assignments of J. A. Jillson and H. Whinfield, New York City. Patented Oct. 9, 1855.

I claim, First, The process of washing, cleansing or extracting gum, dirt or other similar matter from fibrous and textile substances or materials by inserting them in a closed vessel or receiver and forcing the cleansing or extracting fluids to circulate through the materials by the action of a pump.

Second, The rinsing of the materials by forcing fresh cleansing liquids into and through the fibrous and textile substances and materials, and out of the closed washing or extracting chamber by means of a pump.

Third, The forcing of a bleaching solution to circulate through the mass of fibrous and textile substances and material contained within a closed receiver or extracting chamber by means of a pump.

Fourth, The combination of a closed receiver or extracting chamber or vessel with a pump for causing a direct circulation through it, as described.

Fifth, The employment in a closed vessel or receiver of an upper strainer or perforated diaphragm for causing a uniform distribution of the liquid upon the matter treated in combination with a lower perforated diaphragm or strainer for permitting the circulation of the extracting, cleansing or bleaching liquid.

Sixth, The employment of a closed vessel for cleansing or extracting with a fire below, and having a lower perforated diaphragm, whereby the material is above the bottom of the boiler and prevented from being acted upon by the fire.

Seventh, Forming within a closed receiver or extractor a chamber below the lower diaphragm for the cleansing or extracting liquid.

Eighth, The combination of the closed cleansing or extracting vessel, the heater and the pump for forcing the heated liquor to circulate through the mass.

Ninth, The combination of the closed receiver or extracting vessel, the lower perforated diaphragm or strainers, the heater and the pump.

Tenth, The combination of the closed receiver or extracting vessel, the upper and lower perforated diaphragm or strainer and the pump, f.

2,321.—Machine for Cutting Boot and Shoe Soles.—Jesse W. Hatch and Henry Churchill, Rochester, N. Y.

We claim the reciprocating cutter shaft, A, having the endless edged knife or die, C, attached thereto, when the same is made to perform half a revolution between successive cutting strokes, by means of the segment gear, F', or other equivalent means for that purpose, operating substantially as described.

We also claim the reciprocating cutter shaft, when the same is used in connection with the cutting block, M, and guide bar, J, or their equivalents.

We also claim the said cutter shaft, A, guide bar, J, cutting block, M, and discharging plate, T, or their equivalents combined and operating together, substantially as described.

2,322.—Heating Stove.—John W. Lane, Newton, N. J. Patented June 20, 1865.

I claim the fuel chamber, C, having its front plate, W, extending downward, leaving the space, O, through which the circuit draught enters the front chambers, D' D', substantially as described, for the purpose specified.

Second, The fuel chamber, C, having its front plate, W, extend-downward, leaving the space, O, and having its back plate, G, resting directly upon the bottom plate of the stove and provided with the grate, F, substantially as described and for the purpose specified.

DESIGNS.

2,364.—Bracket.—John M. Bellamy (assignor to David A. Titcomb of one-half of said Invention), Charlestown, Mass.

2,365, and 2,366.—Chandelier.—Francis T. Fracker (assignor to The Tucker Manufacturing Company), Boston, Mass. Two Cases.

2,367.—Bracket and Lamp.—Francis T. Fracker (assignor to The Tucker Manufacturing Compapany), Boston, Mass.

2,368.—Clock.—Francis T. Fracker (assignor to The Tucker Manufacturing Company), Boston, Mass.

2,369.—Pendant Light.—Francis T. Fracker (assignor to The Tucker Manufacturing Company), Boston, Mass.

2,370.—Watch Plate.—Edward Howard, Boston, Mass.

2,371.—Tetted Goods.—Moses A. Johnson, Lowell, Mass.

2,372.—Trade Mark.—Edward Locker, Newark, N. J.

2,373.—Trade Mark.—R. J. Roberts, New York City.

2,374.—Trade Mark.—David Shirrell, Buffalo, N. Y.

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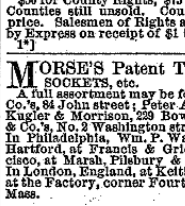

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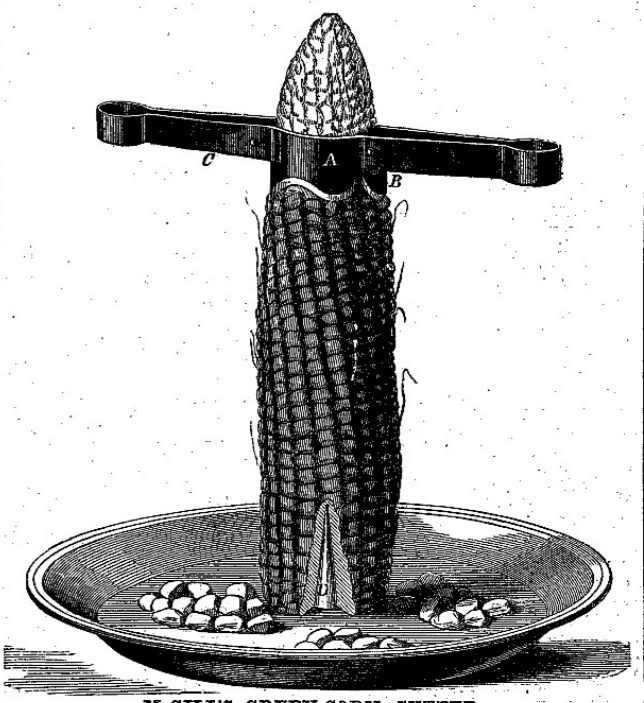
Improved Green-corn Cutter.

Green corn is a delicious vegetable, and a pile of smoking ears, covered with a snowy napkin, maketh glad the heart of man. The pleasure of eating it, however, is much lessened by the necessity of gnawing it off the cob—somewhat after the manner of that other beast from which come hams and lard.

When the kernels are shelled or cut from the cob, all the annoyance is obviated, and for many dishes it is desirable to have the corn so prepared. For this purpose the utensil here shown is claimed to be efficient. It consists, simply, of two semi-circular knives, A and B, fastened to a spring handle, C. These knives are peculiar in form and operate on the kernels by being forced down against them from the top, as shown in the engraving. The opening in the center of the knives is sufficient to insert the ear; as they are pushed down they strip off the kernels, leaving the cob bare. The bottom of the ear is held in place by a short spur, D, on the tin plate which goes with the knife.

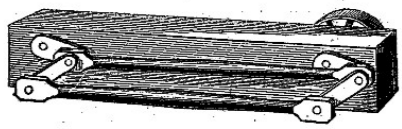
This is a useful invention for persons who put up cans for winter use, and is claimed to act efficiently in all cases. It was patented on April 10, 1866. For further information address William C. McGill, of 277 Walnut street, Cincinnati, Ohio.



McGILL'S GREEN-CORN CUTTER.

ROWELL'S MOVEMENT.

Dr. Warren Rowell, of New York City, has shown us a mechanical movement of which he claims to be the first inventor. It is illustrated herewith, and is capable of transmitting motion from one shaft to another without the use of a belt. Continuous rotary motion, obtained by revolving the pulley shaft, is imparted to the secondary shaft through the connecting rods. Many cases arise in mechanics where



both belts and trains of gears are objectionable. In such places the arrangement above will be found useful where the distances between centers are not too great.

This movement is akin to another in which rotary motion is obtained from one rod connected to cranks, one of which is on the top and the other on the bottom center; the middle of the rod being carried in a slide, which moves back and forth with it.

How Gutta Percha is Obtained.

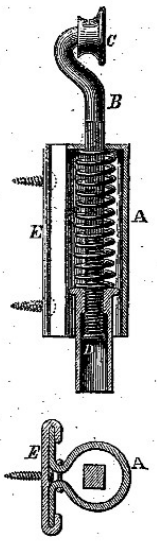
This gum is obtained from the trees when they are about thirty years old. The natives of the Malayan peninsula and of Borneo, obtain it by the destruction of the trees. Attempts have been made to induce them to procure the sap by tapping, but the coagulation of the gum at the apertures, by exposure to the atmosphere, makes it difficult to obtain it in paying quantities. The natives boil the mass in water to soften it, cut it into strips, and then knead it with their feet while plastic, forming it into cakes.

Singular Freak of Lightning.

A correspondent of the Hartford *Press*, writing from South Canaan, Conn., says that during a thunder storm on the 17th of July, a little girl ten years old was prostrated by an electric shock, while standing on a veranda with a hand on a tin conductor, or water pipe, leading from the eaves. The electricity struck the roof, tearing off the slate, and then passed down the pipe, which was at the time full of water. The pipe did not seem to be injured, but the child's hand, arm, and breast appeared as if scalded, and on the breast was a blister about as large as a cent. She was prostrated and rendered insensible, but was restored by the use of cold water.

NELL'S ADJUSTABLE SPRING BRACKET FOR WINDOW SHADES.

Every one using a window shade, the cord of which is secured by a bracket at the bottom, knows that the tension of the cord varies with the state of the atmosphere. The cord contracts in moist weather and increases the tension. Sometimes, also, the pulley upon which the cord runs, on the curtain roll, is not properly centered, and the action is uneven.



The object of the improvement illustrated by the annexed engraving, is to insure a uniform tension at all times—the tension of the cord not depending upon a fixed, immovable point, but being graduated by a spiral spring readily yielding to increased tension.

The bracket, A, of thin metal receives the stem, B, which passes through a square hole in the top of the sheath, and sustains on its upper end the pulley, C. Around the stem, inside the sheath, is a spiral spring which can be shortened by means of the screw tube, D, which slides freely through an aperture in the bottom of the sheath. By turning this tube to the right it screws up on the stem and increases the resistance of the spring, and, by turning it to the left the tension of the spring is relaxed. An upward pressure on the end of the tube with the thumb, will readily disengage the cord, when the sheath or bracket can be slipped from the base, E, if desired. It will be noticed that the heads of the screws or nails that secure the fixture to the window frame, are all concealed. It seems to be a neat, handy, and efficient device.

Patented through the Scientific American Patent Agency June 5, 1866. For further particulars address G. W. Nell, 403 Noble street, Philadelphia.

Improved Cartridge Box.

The common cartridge box is open to serious objections, as was often demonstrated during the late war. The hindrance to rapidity of loading during action by the necessity of lifting the protecting flap, the unsafe character of the box when its contents were subjected to the sudden jolts of a movement on the double-quick, and the lack of capacity for a sufficient number of charges, made the common cartridge box an annoyance.

Paul F. Schneider, Hartford, Conn., has designed an improvement, the patent of which is now pending through the Scientific American Patent Agency, and is designed to obviate these difficulties. His box is cylindrical in form, slung by a shoulder strap and hanging vertically at the side. It is intended to contain at least sixty rounds of metallic cartridges. The box is in two parts, the lower section just deep enough to contain two cartridges, the upper one of which projects its fulminating, or rear end, above the surface of the cylinder. These cartridges are held in tubes and dropped in ball first, one on the top of the other.

Between the lower and upper sections of the box is a space sufficient to receive a gripe of two jaws, formed on a segment of a circle corresponding with the diameter of the cartridge, and calculated to retain the upper cartridge in the lower section of the cylindrical receptacle, by suspending it from the gripe or jaws at the head, which contains the fulminate. Through the outer covering of the cartridge box is an opening corresponding with the tubes containing the cartridges, and as the cylinder is rotated on its axis the tube, coming in line with the aperture, delivers a single cartridge, the upper one being retained by the gripe and sliding over until it drops into the bottom ready for delivery.

Cartridge boxes have before been used for delivering a series of cartridges for a magazine gun, but the principal distinctive feature of this is its quality of delivering only one cartridge at a time, although the tube in line with the discharge orifice may contain a number. A contract has been made to furnish this box to the Prussian Government. Further information can be obtained by addressing W. H. D. Callender, Hartford, Conn.

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